TESTING CHILDREN'S DEVELOPMENT

from

BIRTH TO SCHOOL AGE

PSYCHOLOGY OF EARLY CHILDHOOD

UP TO THE SIXTH YEAR OF AGE

by

WILLIAM STERN

Translated by

ANNA BARWELL

Second enlarged and completely revised edition
Illustrated

"Doctors and educationalists will find much in it of great value to them in their professional work"—*Church Times*

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by

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Translated from the First German Edition (1932)

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Much of the work reported in this book, especially the standardization of the tests, has been made possible by a grant from the ROCKEFFLLER FOUNDATION, New York

AUTHORS' PREFACE

THE developmental tests for the first six years of life which are presented in this book have come into existence in connection with our work in genetic psychology which has extended over a period of many years Tests for the first two years were published in 1928 and 1930, but have been thoroughly revised on the basis of subsequent experience. The remaining tests are published here for the first time.

It has been deemed advisable to include in this publication a chapter on the technique of testing small children, inasmuch as the success of any testing method depends largely on the examiner's skill We have also included chapters on the construction of developmental tests and the evaluation of results.

We are glad that one of our former students, Dr. Henry Beaumont, has undertaken this translation and hope that the Viennese Test Series will be found useful in their English edition

CHARLOTTE BUEHLER

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ELBING

Spring 1934

TRANSLATOR'S PREFACE

THE work done at the Psychological Institute of the University of Vienna under the general direction of Dr Karl Buehler has become favourably known throughout Europe and the United States This is especially true of the studies in child psychology directed by Dr Charlotte Buehler and her one-time assistant, Dr Hildegard Hetzer

In selecting this recent study for translation I have been guided by the greatly increased interest in measuring the development of pre-school children by other means than the older, inadequate "intelligence tests " This interest has been demonstrated materially by a generous grant from the Rockefeller Foundation which has made possible much of the work reported here

The translation adheres very closely to the original, except that by a rearrangement of chapters the tests have been assembled in the second part of the book and examples of some methods, discussed in the original text, have been arranged in the Appendix

The John Day Company, New York, has graciously permitted us to take several test items for the first year from the translation of Dr Buehler's earlier work, *The First Year of Life* (John Day Co , 1930) These items are indicated by an asterisk

Sincere thanks are due to Professors J B Miner and L L. Dantzler for valuable criticism and suggestions

HENRY BEAUMONT

LEXINGTON, KY

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NOTE

THROUGHOUT the text the age of a child has been indicated as follows: the number of years and the number of months have been separated by a " ; " sign, and the number of days from the number of months by a "+" sign. Thus the age of a child fifteen days old is indicated as 0 ; 0+15, that of a child of three months and three days as 0 ; 3+3, that of a child of four years, three months, and fifteen days as 4 ; 3+15, etc.

Numbers in the text refer to the Bibliography on page 171.

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INTRODUCTION

Practical Requirements of a Testing System

The need for an adequate system of tests to be used in connection with a diagnosis and prognosis of development has increased steadily during recent years. Older tests, which were constructed by theoretical psychologists as a basis for a scientific diagnosis of mental structure and development, do not satisfy the requirements of modern practical psychologists, physicians, teachers, educators, and parents. Alfred Binet,[13] the originator of the newer test procedure, had intended it to be a scientific procedure for the detection and demarcation of feeble-mindedness, but it now has to fill more difficult and more complicated demands than were anticipated at the time of its conception. Tests are now to aid in determining the amount of acceleration or retardation in a child's development and the normality or abnormality of his personality. More than that, they should if possible provide a prognosis of further development and indicate the causes of retardation or acceleration so that treatment may be varied accordingly.

The duties of a practical psychologist who has to treat a difficult or retarded child include all those of a physician at the sick-bed. diagnosis, prognosis, cause, and cure. It is, of course, clear that tests alone can never perform all these functions since they are of necessity a purely diagnostic procedure. A good test, however, should have the same function as a good diagnosis which leads the physician to the causes of the trouble and from there to the proper treatment and prognosis. It should give indications which, if followed up with the aid of child psychology, sociology, pedagogy, and education, will lead to the desired information.[228] A modern system of tests may be expected to provide a sound basis for all further psychological work; that is, it should make possible a scientific analysis in the most complete sense of the word.

Another question is just what is to be diagnosed and what to be learned from the test results Binet's task was simple and well-defined: he wanted to compare the intelligence of feeble-minded and normal children of different ages in order to get a basis for segregating the feeble-minded in separate schools. That was a clear-cut programme. Yet, on closer inspection, it was quite complicated, for it embraced three distinct problems: first, to find the intellectual level, second, to bring this in relation to chronological age; third, to express the difference in intelligence between the normal and the feeble-minded Binet complicated the problem further by attempting to ascertain the normal development of intelligence without testing learning ability. The difficult theoretical problems involved in this attempt became clear in the discussion that ensued in the following years The question was raised and argued whether there were such a general intelligence and, if so, how it could be defined. The most widely used and, for a time, the most satisfactory definition was that given by William Stern[292] in the following words: "Intelligence is the general ability of the individual to direct his thinking consciously to new problems It is a general mental adaptability to new tasks and conditions in life "

In animal psychology adaptability to new situations is directly identified with learning ability, and it has been found that there are some very definite situations to which only "intelligent" behaviour can adapt itself. To-day only such adaptations as require a definite understanding of relationships are called intelligent.

William Stern's merit and improvement on Binet was mainly to have pointed out that one has to attempt to make sure what kind of ability and performance one wants to test before constructing a series of tests. The improvement which German scientists, especially Stern, Lipmann, and Bobertag, made in the Binet–Simon tests were of this type in that they tried to develop tests which called for real intelligence, not the outcome of good education and training

Their attempts were continued by American scientists, who were more concerned with the practical uses than with the theoretical implications. Their requirement was to have a system of tests which could be applied generally; that is to say, to immigrant children of different racial and language groups as well as to juveniles with different types of training. It was found that any test which was based on linguistic ability could not be applied generally in this sense of the word and that practically all the Binet–Simon test items presupposed a considerable knowledge of language. Pintner and Paterson, later Bobertag and Lipmann–Bogen, developed tests in which language played no part All later American group tests, such as the National Army Tests and the National Intelligence Tests, on which the best workers, including Thorndike, Terman, and Yerkes collaborated, attempt to presuppose a minimum of linguistic knowledge.

What was tested, however, was still called "intelligence" without closer examination Only Thorndike had raised the objection that it was really quite unknown what was being tested [317] It is especially clear in Lewis Terman's Stanford Revision of the Binet Tests that they test the average mental ability at each age-level to respond, presupposing that the child has had the average school-training offered in civilized countries.

Meanwhile, the purpose of testing had changed completely. Those who came after Binet were not interested merely in separating the feeble-minded from the normal, but in detecting those of more than normal as well as those of sub-normal ability, and in discovering unusual abilities such as Terman and other American investigators did. But a problem which Binet had ignored was still not receiving consideration. the possibility that the difference between the normal individual and the feeble-minded and between the normal and the genius could not be expressed in terms of retardation or acceleration as was attempted.

We shall postpone for the moment the discussion of all these problems to return to the question raised at the beginning of this chapter: What was the practical aim of the intelligence testers from Binet to Terman? We saw that Binet wanted to segregate feeble-minded children in special schools. He had a definite practical purpose and needed simply the diagnosis as such; that is, as an approved means of selection. He did not worry about prognosis, causal relationships, or therapeutic measures The aims of his followers, however, changed almost unnoticeably The Americans as well as the Germans were very much interested in the possibility of prognosis when segregating the more intelligent In this connection it was asked whether intellectual acceleration would remain the same at all age-levels. To answer this question children were retested a number of times Terman considers it a feature of his revision that it really shows the IQ to be practically invariable [264, 294, 228]

Frequent mistakes in the case of children who were selected for higher grades in school on the basis of tests caused scepticism with regard to their prognostic and even diagnostic values. William Stern proposed a combination of test results and teacher-judgments for selection M. Muchow perfected this procedure in the form of an eight-day trial class in which both old and new problems were submitted to the students to be selected These problems were partly in the form of tests and partly in the form of regular school work Even if for practical purposes a satisfactory compromise had been made with regard to the diagnostic and prognostic uses of tests in school placement, the situation was further complicated by the question of their other uses in educational counselling and in public welfare work.

Once more the practical aims of the tests and their requirements had changed. Until then they had been an aid in the selection of students, even though already the immediate followers of Binet used them not only in connection with retarded but also with accelerated ability. It had become clear

even in this application of tests for the selection of students that many factors were neglected in a procedure which took into consideration only intellectual performance and ability. Such factors as will-power and perseverance, honesty and conscientiousness are at least as important for the adjustment and well-being of the individual as his ability. Specialized tests were developed in an attempt to fill this gap, and so the character tests were added to the intelligence tests [149, 309] These new tests satisfied modern demands better than the real intelligence tests. Physicians who only recently had become interested in testing selected the character tests[239] because the need for a diagnostic procedure which gave data on the entire individual and not only on his intelligence had become increasingly apparent. Such a procedure was needed not only in the selection of students but more generally in educational counselling

In connection with the selection of students attempts had been made to obtain optimal performance and to find the upper limits of ability Every intelligence test, therefore, was at the same time very decidedly a performance test. In other words, it was always a kind of examination, and especially in America tests were often devised so that they would get at special knowledge and ability as well as at the general intellectual level of each developmental stage. As performance tests in the narrow sense of the word they often took the place of school examinations. This characteristic and the viewpoint of optimal performance were undesirable after educational advisers had become interested in the tests. Their object was not so much to find out what a child could do in the narrow sense of the word, but how far his general development was advanced His mastery of and attitude towards life in very different fields, his needs, desires, and thoughts—in short, what kind of human being he was—that was the new problem.[210] Realizing the necessity of knowing the general developmental level of a child, Arnold Gesell was the first to develop the

procedure of observing the child's natural reactions in natural situations.[94] This procedure was entirely new compared to the usual testing methods in that it placed emphasis as much on the word "natural" as on the word "observe." Gesell did not want to bring the child in a situation which was artificially controlled by a definite task to be performed. He wanted to let the child move about and show himself in free play; then to compare his behaviour in that natural situation with that of other children of the same age This comparison was to be made not on the basis of a measuring procedure which evaluated quantitatively but by means of a description of what had been observed.

Two facts must be stated to complete the picture of this new method In the first place, in his psycho-clinic Gesell observed mainly small children who could be placed relatively easily in the play situation. The creation of natural situations for children of school age presents considerably more difficulties. Secondly, even Gesell could not avoid creating definite situations in which he placed all children of a certain age in order to get criteria for his comparisons In these typical situations, modes of behaviour which were characteristic of a certain age could be determined, behaviour connected with mastery of body and bodily movements as well as with manipulation of toys and other objects.

The tremendous improvement of Gesell's method on the old testing procedure lies primarily in the fact that it allows the child to act spontaneously and that it permits us to find out what is natural, important, and characteristic in his behaviour Also, the weight has been shifted entirely from a test of the intellectual level to one of the total behaviour.

Gesell has recently distinguished his test items on the basis of seven categories of behaviour: postural behaviour, locomotion, perceptual behaviour, prehension, adaptive behaviour, language behaviour, and social behaviour. With this he has taken a significant step in the direction of the basis on which

our system was founded, though there remain certain differences between the Yale and Vienna Test Systems which seem essential to us.

The Viennese system recognized from its very beginning, in the series which we published in 1928, two fundamental principles:

1. The child's personality was to be studied in all its fundamental dimensions. Our six categories include all the fundamental dimensions of human behaviour.

2. The test items should cover the essential steps which are indispensable to the individual's development

Even though recent developmental tests, such as the Yale series and such others as the Minnesota and the California scale, contain items which are very similar to those which we proposed for our baby tests in 1928, a significant difference remains these systems include many items similar to ours in addition to others, but arranged without a unifying principle of selection. Our own selection and construction of test items was systematic and resulted in a cross-section of the child's personality at each stage of development We shall show later the significance of this procedure for the qualitative evaluation of our results

Further viewpoints in the construction of our tests included the following.

Each test should present as nearly as possible a natural situation and should stimulate the natural response of the child to that situation, not an optimal performance

The results of the tests should be as exact as possible so that they could be expressed and compared statistically. Finally, obtaining results should not take too much time and should not be too difficult. The procedure should be such as could be taught, learned, and used as a definite method.

We started with the premise that one can construct useful tests and characterize an individual's behaviour only after having studied the developmental facts and learned the modes

of behaviour characteristic of each age-level. Extensive observation of the child should take place *before* not *during* the tests. Testing is impossible until one has collected so many observations and facts that in the practical test situation a few conclusive indices suffice to indicate the level one is observing [50] The Viennese tests were therefore built systematically on the basis of a knowledge of child development which was gathered during many years of experimental work [45, 46, 47]

To express the results of the tests quantitatively was not difficult at the time when precise indices of child behaviour provided an exact measure of his development The problem became more difficult since the required number of indices was obtained in natural situations and since so many different situations were created in order to be able to consider all dimensions of personality.

A knowledge of the fundamental categories of human behaviour was lacking On the basis of experimental evidence and general observations we distinguish six such categories which should be reached by the tests In the first place there are the two facts of sense stimulation and spontaneous movements We call these (1) *sense reception* and (2) *bodily movements*. We group under the latter also all those very characteristic movements which serve to increase bodily control The contact with other human beings is to be regarded as specific and fundamental This is category (3)—*social behaviour*. Two further fundamental facts are the ability of behaviour to change on the basis of experience and the activity of the individual by which he changes his environment. These facts are: (4) *learning* and (5) *manipulation of materials* Finally, the basic fact of the creation of and striving towards goals is to be called (6) *mental productivity* All thought processes are included in this category, except that the thoughtful understanding of a situation which manifests itself in conversation is to be classified under "social behaviour" with the sub-title "language." Finally, "imitation" is to be classified under "learning" This

division, which is the result of considerable preliminary work and thought, cannot be theoretically discussed here. Its practicality is demonstrated in the orientation chart which is appended at the end of the book. The trend of development may be seen there from the succession of symptomatic performances: The child reacts to stimuli and directs the movements of his body; he comes in contact with others; he learns from what happens in the environment and takes an active part in shaping and changing the material in that environment; finally, he sets himself new goals and finds his own means of attaining them Thus the child progresses in the course of the first six years from sensory receptivity to mental productivity by learning to control his body, to be in contact with other human beings and materials, and to adjust himself to changes in the environment We shall discuss this outline further in a later chapter and return now to other problems of our test construction.

The problem of finding natural test situations is next to be considered It has already been pointed out that this is much simpler with the small child than with the child of school age and especially with the adolescent The small child may be placed rather easily in a natural play situation by means of toys and proper handling. He will give himself without restraint to this situation and play his part in it without questioning. It is impossible to bring a child of school age into a situation without his asking its purpose On the other hand, the child of that age and kindergarten children who are ready to go to school consider every situation in which a task has to be performed as a perfectly natural one They question the authority which, with the consent of their parents, gives them a certain task to perform much less readily than they would question and feel disturbed by the presence of an observer during their play. In case, therefore, unless one wants to become a member of the school or household for a number of days in order to make observations of the child's behaviour, the only way out is the task situation. This, however, may be

made very different from the examination and performance situation.

We now have a plan for a test system which attempts to include the total natural behaviour of a child while at the same time formulating the results quantitatively as Binet did Since Gesell's work another feature has been added to the system: a diagnosis of the very earliest behaviour of the child during the first year of life. This meets a need of modern public welfare and pedagogy thorough understanding, even in the earliest stages of development, of the child who has to be recommended for adoption or given early special training or health treatment [323] Several physicians had attempted to meet this requirement before psychologists started to work in that direction. The best-known system was that of G. Schwab, which was published a few years before the first Viennese test system ("Baby tests")[132] and at the same time as Gesell's book. The earliest work in the field was probably that of F A. Kuhlmann (1912)[175] and of O Heubner (1919) [133]

Educational guidance, pedagogy, and public welfare require much more from the test system than had been attempted or planned from Binet to Terman These new requirements are the final proof of what tests can do. Test results should offer data which may point to the cause and possible correction of retardation and thus serve those who desire to use educational and therapeutic measures on the basis of a test diagnosis. The results must therefore be such as can be used as a basis for a causal interpretation in order to be useful to educator and counsellor. Only a system of tests, the results of which are open to psychological interpretation, can fill this last and most difficult demand We shall discuss this in detail later.

Testing Development and Personality

In the preceding paragraphs we asked ourselves what sort of diagnosis a test should provide. We found that Binet wanted

it to be a diagnosis of the *intellectual* level of an individual at a certain stage of development Since Gesell's contribution we expect a diagnosis of the *total* level of an individual's development at a certain stage. The problem and the diagnosis, therefore, are both two-dimensional First, it is attempted to find the intellectual or total level which is comparable from one individual to the other, and, second, each performance is given a value in the developmental process. In this respect Binet made an assumption which involved very important and debatable theoretical problems but which was very tempting and convenient in practice, namely, that differences in the level of performances of individuals of the same age may be expressed as developmental differences The child is assigned an intellectual age according to the age of which his intellectual level is characteristic, that is, statistically characteristic Stern has pointed out the dangers of such a measure. The intelligence quotient which was proposed by him and is now generally accepted is an extremely happy discovery which allows us to replace the general statement that a child is retarded so many months or years in his intellectual level by the intelligence quotient, MA/CA This quotient is then comparable from one individual to another.

It is clear that the procedure of expressing differences in intellectual level as differences in developmental level is only permissible under certain conditions, and even then only if supplemented by an interpretation which takes into account the totally different structure of the various levels. So far as we know, the conditions under which such a procedure is justifiable have never been carefully formulated Since we are not here concerned with intelligence tests we shall discuss the problem briefly later with regard to developmental tests. The question, therefore, is not: In how far may differences in intellectual performance be identified with differences in level of development? It is rather: Which modifications of performances and modes of behaviour depend upon development

and may therefore be discovered by testing developmental levels?

Intelligence tests aim to compare the accomplishments of one individual with those of another and from one age-level to another in one particular field—the intellectual. The tests of Gesell, of the Viennese school, and those of certain physicians aim to test the child's performance not for a certain field only but for his total level of development. This appears to be a mere increase in the size of the problem It seems as if the diagnosis of performances in different fields simply takes the place of the diagnosis of performance in one field. However, this does not take into account the real character of the change in the problem—namely, a selection of the types of behaviour to be tested has to be made and consideration given to what we may conclude from such data The following concrete example will make the situation clear

We have before us a two-year-old boy to whom we have given hollow cubes with which to play. We sit at the table with him and watch him He picks up two cubes, puts one of them into the other and lays them aside, only to repeat the procedure several times with different cubes. He does not pile one upon the other, his movements are slow and hesitant. He interrupts his play continuously to look at the experimenter, smile at him, and attract attention to himself and his game by repeating: "Look!" Now the observer takes the cubes and piles one upon the other The child immediately knocks them over with his hand and looks at the experimenter, who piles them up again and says, shaking his forefinger threateningly: "Don't you touch it, leave it alone!" The child looks stunned, smiles shyly at the observer, and does not move.

There are many different factors in this simple everyday situation which we shall attempt to take up in order. In the first place let us consider the problem of what the child does with the cubes. We know the following on the basis of experimental experience:

1. Some factors in the manipulation of this material are characteristic merely of the child's stage of development. The cubes may be put together or piled one upon the other, the experimenter's structure may remain standing and be admired or it may be knocked down This does not depend upon individual differences nor does it vary with the situation, the number of persons present or other circumstances. Statistically speaking, it varies mainly with the age of the child. If one were to give cubes to a large number of one- and two-year-old children to play with, it would be noticed that the majority of those from eleven to thirteen months old put the cubes together, while those two years old build with them [123] Therefore the boy in our example is retarded in the way he manipulates the cubes

2 We said that the child's movements were slow and hesitant. This second factor may be interpreted in the same fashion as the first. We cannot say in general that children of a certain age or under certain conditions usually move slowly and hesitantly, but there are age-levels at which children make slower movements when playing certain games. It may be possible that this boy who is retarded in his play activity still treats cubes in the slowly experimenting fashion which is typical of the beginning of the second year of life. Movements of the child in other situations must be tested before we can decide this If he is found to be generally slow in his movements it is more likely that this is an individual characteristic of the child and an index of the usual speed of his reactions. Another possibility is that the slowness of his movements was caused by the fact that the child lacked experience in manipulation because he had never possessed toys Only further tests can decide between these possibilities. The speed of the child in other types of reaction should be determined and his play with other kinds of material observed.

3. The child showed a very definite type of behaviour towards the observer in that his contact with him was an

extremely close one. The manner in which he reacted to the observer's command was an indication that he understood it and that he was in the stage at which a command still has an immediate restraining influence.[162, 163] The behaviour of the boy in this respect was about normal for his age.

4 The fact that the boy seemed to show more interest in the observer than in his toys may mean a number of things and we need further tests to find its significance The desire on the part of the child to come in contact with the observer may again be characteristic of this particular child if it is found that in general he is more interested in people than in material things. On the other hand, it may be a characteristic of his stage of development and illustrate the desire for tenderness and companionship normal for two-, three-, and four-year-olds. Thirdly, it may be an indication that his environment has provided him merely with social contacts rather than with toys. Finally, the combination of sociability with retardation in the manipulation of materials may be a sign of feeble-mindedness or subnormal intelligence. The child's behaviour in the field of mental productivity should be tested before this can be decided In many cases feeble-minded and unintelligent children show particular aptitude in social behaviour. This correlation will be discussed in more detail later.

Our tests attempt to uncover such factors as are to be regarded as primarily symptomatic for the stage of development We know on the basis of our experimental work that only his manipulation of the cubes and his reactions to the command are definitely symptomatic in this respect Our subject was retarded in his manipulation but normally developed in his social reactions. Each of these types of behaviour indicates a certain stage of development of the individual and for this reason is valuable in our diagnosis.

Two further questions may be raised at this point. In the first place, is it possible, as was suggested above, that a correlation of the two types of behaviour may have diagnostic

value? Moreover, may not the fact that our subject is retarded in handling materials and at the same time well developed in his social behaviour teach us something about the structure of his personality? If this were so, we would be able to say something about this child's personality as well as measure his development by comparison with the normal process of development. Extensive studies of numerous cases have shown that the correlation of different retardations and accelerations in the behaviour of an individual does not give us any further information about him than that he is advanced or retarded. However, it gives us indications of something else: it aids us in finding the possible causes of retardations and accelerations From our previous description of the case we have the following alternatives:

Socially the child is quite normally developed; therefore he must have had normal intercourse with other human beings. Otherwise a two-year-old child would not understand a command. It is possible, however, that his environment has provided a personal interest in him but not enough toys or the proper kind of toys This retardation in using materials may be caused by lack of experience with playthings or by native lack of ability Further tests must give us the necessary criteria to choose between these alternatives. If our subject were to fail on the memory and imitation tests, our suspicion of native intellectual weakness would be strengthened If, on the other hand, memory and imitation performances prove to be normal we would be encouraged in our assumption that the child has not had the proper playthings around him.

Our tests therefore give us the structure of the individual development as well as a starting-point for a causal picture

Steps in the Development of the Viennese Test System

1. The first condition of the Viennese tests is not to stimulate the children to an optimal performance but to find their natural everyday mode of behaviour. Consequently all test

situations have been so chosen that they correspond to natural situations in life. The manipulations and other reactions to which the child is stimulated are no different from his usual ones and are called forth by toys or individuals in the same manner as in his everyday life.

2. We saw that a concrete life situation in which the child acts and moves normally may involve many different problems from the psychological point of view. We must therefore ask ourselves by what considerations we should be guided in selecting and presenting test situations.

3 By continuous observations of children in natural life situations and in numerous experiments we had found those positions of the body, manipulations and total situations which were primarily characteristic of each stage of development. From these we selected those suitable for the test situation, in which a characteristic form of behaviour could be observed quickly and certainly.

4. There are modes of behaviour which are characteristic only temporarily and for a single stage of development, while there are others which are characteristic for all stages The manner in which contact with other individuals is established and the way of manipulating materials are specific and therefore characteristic at every age. Consequently tests of these two types of behaviour are indispensable for each stage of development Each one of our series contains one or more items to test the reaction of the child to other people and to materials. For each stage during earliest childhood, for instance, each month during the first year of life, the degree of mastery of the body is characteristically different Contact with others and manipulation of materials may be extended in more than one direction. We may test language ability and imitation or we may stimulate and test thinking processes or memory These four abilities also frequently form part of our tests since they are constant and characteristic.

5. The question now is, how such special modes of behaviour

may be stimulated in an ordinary life situation. It is, of course, impossible to present a situation which would stimulate just a single response Even when a definite simple stimulus is applied, we never find the child responding with a simple isolated reaction. He makes very different kinds of movements, and among them we find the one for which we are looking. This particular symptomatic mode of behaviour, therefore, must first be investigated by means of experiments and its statistical frequency known before it can be used as a test. As we shall see later, only such responses as were found experimentally in 66 per cent of all cases are considered symptomatic. Test situations are only those in which the expected symptomatic behaviour occurs with this statistical probability and can certainly be observed by every trained observer.

6 Each of our series of tests consists of ten different items. This number was found desirable after a considerable amount of preliminary investigation because it allowed us to observe sufficient symptoms and can easily be used statistically.

7 The age division from one series of tests to another has been found empirically Experiments showed that every month during the first year of life is distinguished from the previous one by characteristically new forms of behaviour until the last four months, at which period we take two months together. In the second year of life the first two three-month periods and the last six-month period form the three developmental stages From the third to the sixth year we had to return to a division in years rather than in half-years as we had planned, because individual differences at this age are greater than at any other period Each year, however, is different from the next as far as the total group is concerned. It is possible that later this preliminary division may be further subdivided by more specialized test items So far all test systems have had to return to yearly periods for children of kindergarten age and have had to give up further subdivisions for the same reasons that compelled us.

PART ONE

THE TECHNIQUE OF TESTING
THE CONSTRUCTION OF TESTS
AND
THE EVALUATION OF RESULTS

CHAPTER

THE TECHNIQUE OF TESTING

General Requirements

Tests should be given to all children under the same conditions if valid results are to be expected, and these conditions should be the best obtainable. It certainly is not sufficient to use the same test material and to follow strictly the instructions given for each test item. It is necessary to create closely similar test situations. To obtain these, attention should be paid to the room and place where the tests are given, the most favourable time for giving the tests and the duration of the testing procedure should be determined, and the relation between the tester and child established All of this, of course, presupposes a condition of the child which is favourable for testing.

We wish to make ourselves clear at this point as to what is meant by close similarity of test situations. Under no circumstances should we attempt to obtain a purely mechanical similarity such as the physicist creates when he performs his experiments under the same physical conditions. We should, however, attempt to create a similarity which is adequate in our particular problem In other words, we do not try to obtain *objective identity* of experimental conditions but *functional similarity*—that is, a similarity of stimulation for each individual. We shall explain later with concrete instructions how we attempt to fulfil this requirement. This is the fundamental idea governing our efforts. To repeat, we are not interested in bringing each child into the same experimental room, but we try to test each child in an environment which is functionally the same in each case.

The fact that we have special requirements on which the similarity of the test situation in the psychological experiment depends and that these requirements under certain

conditions have no validity in any other science is not at all startling. The requirement of similarity of the test situation which all fields of research have in common has always been varied according to the need in various sciences Those factors which influence the peculiar characteristics of the object of investigation must always be considered. The longitude and latitude of the locality where he performs his experiment are most important to one who studies the laws of the pendulum, while the biologist would pay more attention to the time of the year or to the degree of satiation of his laboratory animal [124]

To obey our fundamental law means not simply to present the one and same experimental situation but to consider the functional significance of each important factor. This has been done in the following paragraphs.

The Test Situation

A. THE TESTING-ROOM

As we have seen above, to have a separate test-room and to insist that each child shall be tested in this room would be to violate the law of functional similarity, though it would constitute a similarity in a physical sense In each case this test-room would be unknown to the child—but the sensation of being brought into a strange room is an entirely different one for children of different ages We have investigated this problem of how much children are influenced by a strange environment and found that the degree of disturbance as well as the time required for accommodation vary considerably. This disturbance may show itself in a curtailing of activity, or, on the other hand, in the child being stimulated by the novelty of the situation to looking around and exploring. Until the child is five years old, bringing him into a test-room will mean a very considerable interference Such difficulties as may result from this change after that age will be solved during the short period required for the preparation of the

test material. We therefore do not have to be as careful about avoiding unnecessary changing of rooms with children of that age as we are with younger children

In practice, then, we consider a child "testable" when he is in a room familiar to him. This eliminates the necessity of using various means of counterbalancing the disturbance caused by a strange situation We test the institutional child in his room in the institution and all other children in their home environment if at all possible Rather than considering this a disadvantage, we hold the opposite view We shall see later how this room has to be adapted to the situation so that the requirement of freedom from disturbance during the test may be fulfilled.

Children under two years of age are under no circumstances brought to another room in the institution since the disturbance is too great at that age Even two-year-olds find the way to a test-room twelve yards away too long for their good nature and freedom of expression. In general, we do not test them in a room far from their familiar day room even if they are disturbed by their room-mates playing in that room In this case we have found the following solution Instead of testing them in their own room we take them out in the corridor which is separated from it by a glass partition The fact that every once in a while another child looks at them through the glass, or even speaks to them, and the occasional passing of a nurse through the corridor proved much less distracting than the strange room Even for children during the first two years of life the distraction provided by others in the same room appears to be less than that caused by environmental change.

If it is impossible to test the child in a familiar room we should try to postpone the beginning of the test long enough for the first shock of strangeness to wear off To help the child along we allow a person whom he knows to stay with him and even test unusually shy children on the lap of their mother or nurse We also may allow the child to bring along

some object, such as a toy, from his familiar world. In unusually difficult cases it will be necessary to have the child visit the test-room before the test is given and to allow him to play in it for several hours to get accustomed to the novelty of the situation.

The test-room should not be remarkable in any way and should not arouse the child's curiosity by a large number of unfamiliar objects nor by an unfamiliar emptiness. It must be as similar as possible to the rooms to which the child is accustomed It seems most feasible to have the room arranged as a living-room or nursery

B THE TEST MATERIAL

Not only the strange room and its furnishings arouse the child's curiosity and interest in an undesirable manner, but the tester and the test material are often very disturbing factors. We shall devote a special chapter to all problems relating to the tester

The problem of test materials is especially significant when we are dealing with children from a poor environment which often finds its characteristic expression in a suspicious attitude towards unknown objects [122] We attempt to replace unwelcome objects by more pleasing ones whenever we are definitely able to say that the refusal to accept certain objects is due to their strangeness or when the child shows a very definite dislike for a certain object In that case we have to use the spoon, powder-box, cakes, and toys which it sees every day, because it is true also of the test material that we must use what is functionally similar rather than physically identical.

This is especially important when the test is an improvised one or when an item of the test material is missing. In such cases various items may well be replaced by others on the basis of functional similarity. For instance, in one of the test items for the second year of life the small rubber ball with a disappearing chick may very well be replaced by a box with contents, a

"Jack-in-the-box" or a rubber quadruped which sticks out its tongue and tail when squeezed.

C. THE PLACE OF TESTING

What we have said before with regard to the selection of the room is also true of the selection of the place in the room where the test is to be given, especially when the subject is under two years of age. It is rather simple to obtain a table and chair suitable for older children. We prefer to test younger children, especially those in the first year of life, in the place where they spend most of their time—for instance, in their go-cart, bed, or play-pen They should have plenty of room to move about, the mattress should be of a certain quality which we shall describe later. The following illustration will show how to proceed when a change of place is positively necessary.

When testing a pair of twins in a certain family we found that the baskets in which the two seven-month-old children usually were kept were too small for our purpose We wanted to select a place for our test where the minimum distraction would be encountered and found by asking the mother that the children were put on the couch every evening when their father wanted to play with them Testing them on this couch took place without any difficulty Even lighting the floor lamp did not distract the children's attention from the test since this was a very familiar experience to them.

The Part of the Tester in the Test Situation

That the experimenter is unknown to the child does not matter much during the first four months of life, since at that age reactions to people are unspecific. The tester of older children must get acquainted with them before testing can begin. Little difficulty is experienced with children between the fifth and eighth months when the tester occupies himself

with them a few minutes before beginning the test He may offer them a toy or move some object from their immediate environment before their eyes If there is no toy or other suitable object available, he may let them play with the rattle which is part of our experimental material It is not always possible to gain the confidence of a child older than eight months by this simple means If one is greeted with crying, as is often the case, there is then a stronger resistance to overcome It is advisable not to seek contact with the child immediately from the start, but to give him a toy in a casual manner and if possible create the impression of not noticing him at all. If one begins by acting more or less reserved, contact will usually be established while the test is in progress. Of course, certain test items, such as those involving ability for social contact, cannot be solved without it However, the resistance is usually increased by a too zealous initial approach This same attitude may be recommended in dealing with children of the second year of life whose resistance is still stronger than that of younger children

If it is necessary only to establish contact with children during the first two years, it becomes necessary later to get their co-operation in solving the problems presented in the tests Problems in the true sense of the word are not given during the first two years The stubbornness and lack of perseverance typical of the two-year-old often make it hard to get his co-operation Beginning with the fourth year we observe a distinct reduction in the difficulties connected with establishing contact The six-year-old is a subject on whose co-operation we may count with as much certainty as on that of an adult

Presenting playthings is the best way of establishing contact with two- to five-year-olds when they do not seek contact voluntarily Reasoning and promises do not help, these usually increase the resistance However, showing a suitable toy will often get the attention of the child He forgets the novelty of the situation while playing with it, and a few essential remarks

of the tester often bring about the desired contact. The experimenter must attempt not to be a factor which attracts the attention of the child but remain a natural and quite subordinate part of the situation.

Once the contact has been established and the child has been put at ease the test procedure may begin. The experimenter must make sure that his choice of words is intelligible to the child in instructions as well as in all other contacts by means of the spoken word Verbal instructions frequently do not suffice when the child is younger It is often necessary to point or make a gesture as has been indicated in the instructions for the various test items Complicated phrases and difficult words must at all times be avoided

The contact which was established at the beginning of the testing period may not be neglected during the procedure. It is to be recommended that the experimenter, in testing children of two years and over, make some appreciative remark after each test item, regardless of whether the child solved the problem satisfactorily or failed. Shy children need such encouragement much more than self-confident ones, and one should be careful not to encourage the latter too much.

Over-emphasis of the contact between tester and child should be carefully avoided A certain amount of reserve is necessary with children of all ages who have strong social interests Such children usually meet the experimenter halfway in his attempt to seek contact and frequently even take the initiative This contact fascinates them so that nothing else is interesting to them Their eyes are glued on the experimenter and they overlook anything that he may offer them. This behaviour constitutes a real handicap in the test procedure and often leads to failure on the part of the child, which is not caused by lack of ability in that particular field but by too great emphasis on the social contact This is the most frequent type of interference we encounter about the middle of the first year of life. The necessity of using reserve when dealing with

these too socially inclined children leads to another rule which should be observed In such cases, test items dealing with social contact should be postponed to the last. Play situations in which competition and understanding of the rules of the game are involved, for example, should be presented at the end of the series for such children.

Distractions

It does not satisfy all the requirements for a smooth functioning of the test to give it in a familiar room, paying special attention to the position of the tester in the situation. The test situation should be free from interruptions from the outside as well as from those resulting from an inaccurate procedure.

A. *OUTSIDE INTERRUPTIONS*

It goes without saying that a test can be successful only when the child is entirely free from outside distractions. In a separate testing-room we can easily provide the necessary quiet surroundings, and if the test is given in the child's home it will usually be possible to change the daily routine in so far as it might interfere with the testing. The main difficulty in that case is the presence of others in the room. Although we prefer to be alone with the child because every other person present might mean a distracting factor, we sometimes include others in the test situation in order to put the child at ease by the presence of familiar individuals. They must, of course, agree to remain perfectly passive and may under no circumstances take part in the proceedings Any deviation from that rule, whether in the form of a word of encouragement or even an approving or disapproving glance, must be prevented.

The situation is different when we test the children in a room in an institution where they are together with other children. Our choice of the best time for testing in this case depends not only on the child, who, of course, should never be tested

unless he is in a favourable condition for it, but also on the routine of the institution which cannot be changed as easily as that of the private home We shall then have to choose a time when it is most quiet in the room Obviously, dressing-time and the time for medical inspection are out of the question since too many people are in the room at that time. The period devoted to free play would be much more suitable, because we will then have a better chance to arrange the situation to suit our needs

Whether the routine matters going on in the room provide a distraction depends largely upon the age of the child. The youngest children are most immune to such distractions since during the first five months they react only to direct stimulation. They pay scarcely any attention to those who are at some distance from them in the room Older children may not pay attention to such influences for other reasons; they already possess a certain amount of concentration, and the test situation is more interesting to them than the matters of daily routine.

We have urged that children under two years old be tested in their usual room whenever possible, as disturbances caused by other children in the same room rarely present insurmountable difficulties Only during his first three days in the institution is the average child irritated by the crying of others; after that he pays no attention to it Social contacts with others during the testing procedure form a greater problem. The attention of other children may usually be drawn away from the child we want to test by giving them toys to play with The possibilities for such contacts may be further limited by selecting a favourable spot in the room for testing For instance, the child can be so placed in his bed and the presentation of test materials so arranged that he has to turn his back to the others. He might also be isolated by means of a screen, but we avoid doing this since we have found that the amount of distraction which the screen provides differs so much for each age that it is impossible to evaluate it.

Children of three and older who are irritated by a complete isolation from other children will require some such arrangement as was described above when we spoke of partly separating them by testing them in the corridor.

There is usually no difficulty in isolating six-year-olds, although it is sometimes necessary to keep them in good spirits by permitting the presence of another child in the room His little friend will then have to observe all the rules set up for adult visitors, and his silence can be bought by giving him something interesting to do.

Reluctant as we are to make any changes in the normal environment of the child, we realize that circumstances may compel such a change The toy which the child repeatedly picks up during the test procedure will have to be removed as will the powder-box on the table next to the crib of the infant who repeatedly grasps for this favourite object

B. INACCURATE PROCEDURE

Inaccuracies in the procedure include every difficulty arising from a careless or insufficient preparation of the test material or from the test procedure itself. The equipment of the room is not hard to arrange, but it must meet certain demands The most fundamental one is to allow the child enough room for movement. The crib in which children under six months of age are to be tested should measure at least 82 by 45 cm., and these dimensions should be at least 106 by 70 cm. for the second half of the first year of life The under-surface has to be of a certain type since it plays an important part in the tests of bodily control "Lifting the head while in prone position" becomes much harder when the child lies on a soft pillow than when the mattress is harder "Lifting the head while in dorsal position" becomes easier when the head is higher than the rest of the body. The mattress should therefore be flat and not too soft (preferably filled with horsehair). Children in the second year of life will best be tested in

their play-pen or on a soft carpet, while older children should have adequate sitting accommodation

The position of the tester is important and should be changed as infrequently as possible He has to be where he can observe the child carefully. In many tests it is necessary to observe from the side, as in "lifting the head for a few seconds in the prone position," when it is impossible to say whether or not the child has succeeded if we try to observe from the foot of the crib On the other hand, the position of the experimenter should be so chosen that he can escape the attention of the child as much as possible In testing children two years old and over the tester can best take a position behind the child, unless, of course, this causes the child to turn to look at him.

It is important for the successful completion of the test that the experimenter knows the child to be safe For this reason a railed cot is preferable to the dressing-table from which the child could easily roll off, while the play-pen is preferable to the carpet on which he could easily crawl away as soon as the experimenter turns away for a moment

The proper presentation of the test materials and the place where they are kept during the procedure next require our attention. The child should never have more than one thing demanding his attention at any one time All materials not in use should be kept hidden in a large box to avoid distraction. Care should be taken not to leave the child in possession of any material longer than necessary; otherwise his interest might easily decrease and the test be unnecessarily prolonged. Nothing should be taken away, however, before the next thing is given the child because his good nature would be imposed on by so doing. On seeing the new material the child will seldom be able to resist its fascination and it will be much easier for him to part with the material already used. For this reason the order in which the test items are presented is of great importance. A more desirable type of material should never be placed in competition with a less desirable one. During the second year,

for instance, the cubes, at that time the favourite material, should not be offered during the latent period of the memory test since it is necessary to interest the child in recalling something else at a very definite moment The emotional disturbance caused by his parting with the cubes would mean failure on the memory test

Each object should be presented only once. If the same material is used in more than one item, these items should be given in immediate succession.

Filling periods between test items with looking for materials should be avoided as carefully as too much haste in presenting items which may easily lead to minor accidents If the test materials are dropped or the child loses his balance, it usually means the end of the test since the child is seldom able to forget such experiences

In our attempt to keep our subjects in good spirits we must not only take great care in exchanging materials during the test but also try to arrange to give at the end of the test those items which are most likely to interfere with his spirits Showing a mask to the infant and items involving the disappearance of individuals and objects used in testing memory are to be reserved for the last if possible This is true also of such tests for older children as might cause them to feel hurt because they lose in a game or in case they insist on finishing the task attempted when dissatisfied with the outcome of their efforts. We shall often have to allow the subject to finish the game or give him time to solve a problem completely, if only to keep him in good spirits, even though this may be quite irrelevant to the outcome of the test.

On the other hand, it is quite possible for a child to be in too high spirits to be tested successfully A too cheerful mood, often caused by the pleasure derived from the social contact with the tester, which causes the child to forget everything else, makes it just as impossible for him to pay attention to the test as did his ill humour, though in a different manner.

Postponing to the last those items which require close social contact is the best remedy in cases of this sort

We may conclude by saying that a definite order in which to present the test items cannot be given since we must proceed quite differently with lively and socially inclined children than with children who have to be warmed up by social contact. The order suggested in this book is therefore very desirable but by no means the only one.

The importance of paying attention to the bodily position of the child during the test cannot be over-emphasized This problem is usually solved, so far as children from the third to the sixth year are concerned, by supplying furniture suitable to them, since they solve most test items sitting at a table. As it cannot be expected of them to remain quietly seated during all the items they have to work out at the table, it is advisable to alternate these with items which allow them to stand up and walk around They should not be required to remain seated unless the test item makes it absolutely necessary, they should be allowed to walk around and use the floor whenever this will not interfere with their reactions to the test. In such items as "building a named structure" or "understanding the rules of a game" it is totally irrelevant whether the child stands or sits, and he may very well build or play his game sitting on the floor Children will feel more at ease, and hence the test situation is more favourable when the tester thus considers the desires and habits of the child.

The problem of posture during the test is much more difficult during the first eighteen months of life The child of this age is even less able than the older child to remain in the same position throughout the test What is more important, his ability to perform is influenced very decidedly by his posture. As long as he has not mastered a certain position completely, his attention is so taken up by it that he is unable to do anything else. This was very clear in the example of the seven-month-old boy, which has already been cited in another con-

nection This boy could sit steadily without support as long as nothing distracted him, but toppled over just as soon as his attention was called to a rattle, which he then attempted to grasp — and grasping plus sitting up was too much for him

In our tests we have made use of the fact that to require a certain position during the test makes it harder for the child. Some of our test situations require the child to liberate himself from a cloth This has to be done in all possible positions · on the back, prone, sitting with support, etc In items of this sort a particular type of posture is essential and no variation is allowed. Hence we have to attempt to bring the child to the required position the best way we can This is not so easily done since children of this age show special preference for certain positions and cannot be reasoned with Take as an illustration the protocol of a seven-month-old boy.

S is in prone position, kicks his legs, pulls on the sheet E lowers the side of the bed, picks S up S protests violently, kicks his legs and arms, utters sounds of displeasure E places the child in bed on his back, turns aside to take a rattle from the table Meanwhile, S has raised himself sideways on his elbow and turned over on his stomach E attempts again to place the child on his back Violent crying, kicking as soon as S is on his back E attempts in vain to quiet S by rattling, S continues to return to his former position.

The difficulties increase with older children who are better able to move away A boy of 1 ; 2 came to our attention who in the course of the test had attempted thirty-four times to get up, and had always responded with signs of displeasure when he was made to sit down. It was necessary to have him sit down, since he could stand up only when holding on with both hands, and this precluded the possibility of any other activity Such obstinacy can be overcome only with much patience We must attempt to persuade the child to change his position to the one desired by giving him something to play with or by similar means. When the child who sits or stands with support is given an object in his hand he will usually sit

or lie down voluntarily and the change of posture will take place without difficulty If this is impossible it must be attempted to distract his attention while getting him in the desired position. This may be done by talking to him and occupying him in other ways during and immediately after the change. However, there will always be children who cannot be changed to other positions effectively.

Boy, 0,7 S is in prone position E lifts him up and attempts to set him down in a corner of the bed S begins to cry, stretches his legs, stiffens his muscles so that it is impossible to put him down He lies down, kicks, cries, turns on his side, pushes himself along, finally turns completely over on his stomach

Cases in which a change of position has to be made forcibly should be limited to a minimum because they involve such important problems It cannot be avoided in those items which test the child's reaction to a certain position or the influence of his posture on certain performances In some other test items posture is very important for the successful solution of the problems involved. "Drumming with two sticks," for instance, is a task which cannot be performed while lying on the back. Aside from these items in which the difficulties of postural changes must be overcome under any circumstances, there are many in which the position is irrelevant from the point of view of the problem or its successful solution. Social play with the ten-month-old infant can be tested when the child is on his stomach, on his back, when he sits up or stands with support. It is important that the child be in a position which does not present any difficulties so that he can give himself entirely to the test situation. We have therefore not prescribed any positions for those items in which posture is irrelevant In those items the similarity in condition should again be a functional one; the conditions under which the test is performed are then similar when the child is in a position which holds no difficulties for him

The Condition of the Child

After our discussion of interferences with the test procedure due to external conditions or to failure to properly present the tests, we have to devote our attention to some interferences which are caused by unfavourable conditions of the child Since we test children under as nearly the same optimal conditions as possible we shall have to make ourselves clear as to what we mean by these.

In general, we test a child only when he is healthy and in a condition which makes it possible for the test to proceed smoothly. This means that the child should not be handicapped in his ability to react by fatigue or by disturbing events which took place just before the test.

Children who are ill temporarily are usually not tested except when we want to find the influence of their illness on their performance. In children who are chronically ill the disease presents really a normal condition and they therefore are not barred from the tests

Aside from illness and fatigue the state of hunger or satiation, especially in the younger children, is an important physical factor

How much hunger and satiation influence performance depends on many factors, primarily on the age of the child and the type of performance in question Rowena Ripin found in her experiments on the ability of infants to distinguish the bottle from the rattle that hungry children of 0 , 5 recognized the bottle correctly in 80 per cent of the cases, while in a state of satiation they only recognized it in 40 per cent of the cases [128]

One should wait at least one hour after feeding before testing children up to eighteen months old, it is not advisable to test them less than one hour before feeding.

This rest period should also be observed in older children, at least after the main meal We shall see later that the forenoon suggests itself as the most favourable period for testing.

We never begin the test when the child is not in good spirits or is excited unless we are reasonably sure that we can overcome

his crying, fear, or displeasure in the course of the testing procedure In these cases it is recommended to start with the simplest items and to consider which item might best be suited to put the child in better spirit In the first place, the child will then be most likely to solve these problems correctly. Secondly, he will have a chance to correct, during later more difficult items, those mistakes that were caused by the fact that he was not feeling well Items in which the child was not successful merely because he started to cry or was irritated in other ways may be repeated whenever such repetition does not facilitate the performance greatly "Sorting slips of paper," for instance, may well be repeated as may be specific reactions to the human face. In memory tests, however, repetition is not permissible. This same procedure is to be followed if failure is due to lack of co-operation or too great pleasure in social contact rather than to inability in that special field.

Events which occurred just before the test and are likely to interfere with the procedure are largely eliminated by our attempts to make the situation familiar and to subordinate the tester in the situation We must, however, also consider events unrelated to the test procedure which happened to the child. It would be better to postpone until the next day the testing of a three-year-old who came just after a violent obstinacy scene. In this connection a recent change in the home environment is most important and the child should be given a chance to get acquainted with his new surroundings Children who have been recently received in an institution or who have changed from one family to another should not be tested until after an interval of at least three days This period usually suffices to quiet down their excitement.

The Time of Day and the Duration of Tests

The time of day and the duration of the test are important factors in keeping the child's condition favourable for taking the tests.

A. THE TIME OF DAY MOST FAVOURABLE FOR TESTING

The early morning hours are to be recommended for all children, because at that time they are most alert and responsive. This period is the only one that can be used with children during the first two years of life Older children may be tested in the

TABLE I

How the Day is Spent (Percentage of each Period)[46, 44]

Time	Positive Waking State	Negative Waking State	Sleep	Feeding
		Boy, 0 , 2		
6–9	25 0	32 8	42 2	0 0
9–12	63 0	15 9	9 9	11 2
12–15	2 7	11 7	66 7	18 9
15–18	28 2	50 6	13 7	7 5
18–21	21 3	44 3	20 8	13 6
21–24	7 2	0 0	87 4	5 4
24–3	22 8	27 2	50 0	0 0
3–6	0 0	30 5	67 3	2 2
		Girl, 0 , 8		
6–9	57 3	5 5	32 2	5 0
9–12	100 0	0 0	0 0	0 0
12–15	68 5	16 5	0 0	15 0
15–18	55 6	21 6	19 4	3 4
18–21	9 4	0 0	84 0	6 6
21–24	0 0	0 0	100 0	0 0
24–3	0 0	0 0	100 0	0 0
3–6	44 4	1 6	54 0	0 0

afternoon, if necessary, but the rest period after the main meal must be observed

Those periods in the day of the young infant which are not used for sleeping and dozing but for experimenting and exploring objects in the environment or his own body are, of course, to be selected as most suitable for giving the tests. These waking

periods are not distributed equally over the whole day, as can be easily shown by trying to experiment with young children in the afternoon. A much greater number of failures due to sleepiness and displeasure of the child will occur at that time than in the morning.

We have determined the distribution of the various types of behaviour throughout the day by means of twenty-four-hour observations of children in natural situations. Opposite are two tables, chosen at random, to illustrate.

From the foregoing tables it is easy to determine the most favourable time for testing These distributions are characteristic for the respective ages they represent. They show that it becomes easier to find suitable periods as the age of the child increases The older the child, the greater the number of receptive waking hours. These waking states represent an exception in the case of very young infants and become more and more common as they grow up The probability that a test begun under favourable conditions may be completed without serious interruptions also becomes much greater with the increasing age of the subjects This leads to our second problem.

B THE DURATION OF THE TESTS

Whether the child will co-operate throughout the tests depends on whether the time required falls within the limits of his endurance The tests will have to be given as rapidly as possible to young infants whose responsive periods are very brief In order to correlate the endurance and the time required for the tests at each age-level we have observed children in their natural behaviour and determined how long they occupy themselves with any one thing without being encouraged, as well as how long they can be active without a longer rest period. The test items in our series were so constructed that they never take quite as long as the child would voluntarily give to that particular type of activity at the given age The time required for the entire series for each age is on the average

only half as long as the average longest periods devoted to continuous play by children of that age group. Periods of from ten to twenty minutes suffice for the first-year series, thirty to forty-five minutes for the second year, while the series for older children can be given in one hour Careful preparation of test materials will, of course, contribute to cutting down the time required, which is always desirable. We even omit to record results during the test procedure with children in the first three months of life since such recording after each item would prolong the procedure If we do not use an assistant to take down the results we postpone this until the end of the series because each minute by which we can shorten the testing period means a distinct gain at that age Recording results for older children can often be done while they devote their attention to the next item because the tester does not have to take a continuously active part in the procedure. The one-year-old, for instance, plays with wooden cubes for five minutes without interruption Moreover, older children can use a brief interruption as a desirable rest period

A further saving in testing time can be effected by taking in succession such items as require only a minor change in material or attitude and by avoiding all unnecessary repetitions of test items. After the child has demonstrated his ability to repeat eight syllables and four figures, nothing new can be learned by asking him to repeat four syllables. This leads to the rule that those items may be omitted from each series the solution of which is a prerequisite to the solution of an item which has already been solved.

Just as the duration of the test may be shortened by arranging together test items requiring the same material or situation, so it is possible to introduce rest periods for the child by the opposite procedure We must preserve a certain measure of liberty in arranging test items and be able to drop an item which has already been offered and present it again when conditions become more favourable. This will often be the case with

items requiring the subject to talk Bashful children only do this after adequate contact with the tester. It may occur that one attempts unsuccessfully to get the child to talk and that the item will have to be repeated later when the necessary contact has been established. This same situation occurs with younger children when the required posture cannot be achieved on the first attempt In this case we will have to return to this item later since an effort to force the child to talk or to take the desired position at that time would mean prolonging and sometimes blocking the test procedure

Special attention must be given to arranging the test items involving memory when a certain latent period has to be observed These must be arranged so that this latent period may be filled with other items Care must be taken to avoid a concurrence of two latent periods and to begin a second memory test only after the first has been completed

Individual Differences of the Subjects

It should be clear from what has been said before that we do not prescribe a rigid testing procedure but that we attempt by every possible means to allow for individual differences of the subjects Similarity of test situations is accomplished with due regard for such differences In our system a familiar room and a posture which presents no difficulties are prerequisites for the functional similarity of experimental conditions Nor do we insist on using the identical material each time since some other than the prescribed objects may do just as well. This is another point concerning which the likes and dislikes of the subjects should be respected Finally, it has been pointed out how important it is to know the events that have influenced the child one way or the other before the beginning of the test. We must attempt in each case individually to produce a situation suitable for testing and must consider the good or bad disposition of the child as much as his greater

or lesser initiative in establishing social contact A more or less reserved attitude should be assumed by the tester according to the social attitude of the child. The order in which the test items are presented, especially those involving social contact, should also be determined by this factor

The individual characteristics of the child must be considered also in the way the test materials are offered him Retiring children will have to be coaxed to take them while the more aggressive ones will grasp them if they are placed near enough. The aggressiveness of the child and his persistency in sticking to one type of occupation will determine whether the change from one material to another will prove simple or will require special precautions on the part of the tester Usually the tester will know after working with the child for a few moments where his particular difficulties lie, and what will have to be watched if the test is to be a success

Certain difficulties will have to be met in the cases of unusually fast or slow children Our tests usually are so arranged that the time required depends mainly on the subject's speed of reaction The times indicated are maximal ones, for instance, the length of time during which wooden blocks should be left for the child to play with We know on the basis of many observations that nothing of importance may be expected after this period has elapsed. In most cases, however, it is optional with the child how fast he wants to solve each problem, and we arrange our tests accordingly. It has happened that a test which usually takes one half-hour has taken two hours with unusually slow and passive children We shall see later how speed enters in the evaluation of test results. Only when the child is clearly marking time in items which do not test perseverance do we attempt to speed him up

The more passive among the youngest infants present special difficulties because it is often necessary to occupy oneself with them long beyond the duration of the test in order to observe them in locomotion or to find them in the proper

mood to take the position required to test their bodily control. Restless children who cannot be kept in the same place at all present difficulties of the opposite type. In both cases the desired activity must be elicited and the undesired one checked by repeated attempts to create interest in an object or occupation.

By limiting the duration of the test to the time absolutely necessary, fatigue should be reduced to a minimum. This can usually be done. In the case of children who grow very tired during the procedure, either because they fatigue easily or because they were not very alert when the test began, it is best to discontinue the test until the next day. It is, however, not advisable to have an intermission of more than one day since these items are designated to test development at a certain stage and we are in danger of finding new developments if we interrupt our procedure too long Especially in children who are in the first months of life the developmental level might be entirely different at the end than at the beginning of the test since each week, even each day, brings developmental progress.

It should be borne in mind, when arranging the test items, that not all children will perform equally well or poorly at the same point in the procedure We have recommended to begin, whenever possible, with simpler items to give the child a chance to get "warmed up" This does not mean, however, that we should proceed mechanically to more and more difficult items; in other words, begin with the series preceding the basic one and proceed from there on This would mean that the last items given the child would be taken from series harder than the basic one, and failure in these items might well be caused by fatigue, which would invalidate our results After a "warming-up" period we usually give the harder items first in order to finish up with the easier ones Nor should this be done mechanically Some children give the best that is in them only towards the end, others shortly after the start. Children of the latter type may be given the harder items very early, while those who "warm up" more slowly and whose per-

formances improve constantly in the course of the procedure may be given the more difficult items towards the end The general behaviour of the subject during the test will indicate the degree to which he has "warmed up." In judging the child one should consider not only how the item was passed but also whether he could have been more attentive, whether he played his proper part in the total situation and whether his attitude was co-operative.

The relative difficulty of test items should not be judged only by the series from which they are taken; it should be understood that individual differences largely affect that difficulty. Items requiring linguistic ability will be most difficult for a child whose language development is retarded, while items requiring bodily control will be very easy for the child who is advanced for his age in controlling his body, even though this item may be taken from a series more difficult than the basic one for his age.

Omissions and Changes in the Procedure

The duration of the test procedure should be made as short as possible, and we have already indicated a number of ways in which this can be done Proper preparation of the tests and logical sequence of the test items further this end, while under certain conditions we omit an item not bearing on the final result to any great extent We may even omit the use of the series preceding or following the basic one * We further omit all those items which we are sure will or will not be passed This is the case whenever a child has already passed an item which contains the solution of the item in question or when he has failed to pass one which is a prerequisite for the solution of this one. In this case, however, we should make quite sure that no other causes besides inability to pass the item have been responsible for the failure. The novice

* See page 63.

in testing should use extreme care in omitting items since the relation between individual items may not be clear to him If only a limited amount of time is at his disposal he should not attempt to give a complete test but limit himself to an abbreviated one. This allows an approximate diagnosis of the child which cannot be evaluated statistically. We have indicated in each series those items which because of their importance form an abbreviated test. It should not be necessary to emphasize that this abbreviated procedure is in no way an adequate substitute for the complete series.

Under certain conditions test items may have to be repeated. This is necessary when the first presentation was interrupted at the very beginning upon the discovery that it was started at the wrong moment. A repetition of an item after it has been completed is permissible when the tester becomes convinced during the remainder of the procedure that failure on this item was not due to lack of ability but to lack of attention, co-operation, etc In such cases the item which at first remained unsolved is evaluated as passed in the final results because of the successful performance at the time of its second presentation.

The Selection of Tests to be Given the Child

The series of tests constructed for the age corresponding to the chronological age of the child to be tested forms the basic series with which the test is begun. Thus the series for the third month is the basic series for a child from 0, 2 to 0, 2+29, that for the second half of the second year of life for a child from 1 ; 6 to 1 ; 11+29, while the series for the fourth year is the basic one for a youngster from 3 ; 0 to 3 ; 11+29

Besides this each child is given the two series immediately preceding and the two immediately following the basic series, so that each child is given five tests. For example, a child of 0 ; 11 is given the tests for the eleventh and twelfth months

as the basic series followed by those for the first and for the second quarter of the second year as well as those for the ninth and tenth months and for the eighth month.

Experience has shown that five series suffice to test the reaction patterns of the normal child and to give him a chance to make up for developmental retardation in one field by showing acceleration in another, at least as long as both deviations remain within the boundaries of the normal Under certain conditions it is not necessary to give all five tests

1. We have found by experience that when a child has passed at least eight of the items of a series, the series immediately preceding this may be considered as completely passed and need not be presented.

2 We do not present a more difficult series when the child has failed to pass more than two items of any test

Another deviation from our regular procedure is presented in the cases of children with special aptitudes or deficiencies If the upper limit of development is not reached by the second series following the basic one we shall have to continue our procedure until the child cannot pass more than two items in a series. Only then do we consider the upper limit reached; tests should be continued until this situation occurs

An example:

Boy, CA o , 6.

Basic series seventh month, passed 10 items
eighth month, passed 9 items
ninth–tenth months, passed 8 items
eleventh–twelfth months, passed 1 item

It was unnecessary in this case to present either the series preceding the seventh or those following that for the eleventh to twelfth months.

The same situation exists when the second series preceding the basic one does not reach the lower limit of development, which we consider reached only when at least eight items of a series are passed. Whenever a child passes fewer than eight

items of a series we present the next easier one until he can pass eight or more of the items.

An example:

Boy, CA 2 , 7

Basic series (third year),	passed	0 items.
(1 , 6 to 1 , 11+29),	,,	4 ,,
(1 , 3 to 1 , 5+29),	,,	6 ,,
(1 , 0 to 1 , 2+29),	,,	6 ,,
(0 , 10 to 0 , 11+29),	,,	7 ,,
(0 , 8 to 0 , 9+29),	,,	8 ,,

We may summarize our procedure as follows We present to every child five test series or as many more or less as may be necessary to reach the limits of his development as shown by his passing two or fewer items of the most difficult and eight or more of the easiest series

These conditions can, of course, not be fulfilled for the youngest children since no series preceding the first month can be given. We have attempted to consider this fact in constructing the first series The lack of more difficult series to present to four- and five-year-olds will be supplied as our tests for older children are developed

More than five series will have to be presented not only when there is an unusual amount of general acceleration or retardation of development but also when the child shows a great difference in development in individual fields In such cases we often use the abbreviated procedure and continue only with more difficult or easier items, testing this special function instead of giving the entire series.

Examples·

Boy 146, CA 0 , 9+26

Series	0 , 6	0 , 7	0 , 8	0 , 10	1 , 0	1 , 3
Passed	—	10	8	8	3	1
Failed	—	0	2	2	7	9

Boy 68, CA 1 ; 4.

Series	0 , 7	0 , 8	0 , 10	1 , 0	1 , 3	1 ; 6	1 ; 9
Passed	9	7	6	3	1	—	—
Failed	1	3	4	7	9	—	—

Boy 27, CA 1 ; 4, fails completely on all memory tests He cannot remember the chick that has disappeared or the contents of a box after eight minutes, as required for his age, nor for three minutes (1 ; 0 series) nor even for one minute (0 ; 10 series) "Finding a hidden object" (0 , 8) is not passed, nor is "searching for a lost toy" (0 ; 7). However, the items of the 0 , 5 test—"reacting to withdrawal of a toy" and "expecting a repeated stimulus to reappear"—were passed, so that the lower limit of this special ability has now been determined. The lower limits of all other abilities were considerably higher

CHAPTER II

QUANTITATIVE AND QUALITATIVE EVALUATION OF THE TEST RESULTS

The Developmental Quotient

The simplest way of presenting test results is in mathematical terms; but this one-sided analysis should, as we shall see later, be supplemented by a qualitative one.

In our quantitative evaluation we proceed as follows. In the basic series, the one that is constructed for the age-level corresponding to the chronological age of the subject, and in the two series immediately following, each item passed is counted positively; each item missed in the two preceding series is counted negatively Items missed in the basic series and in the two more difficult ones as well as items passed in the two easier ones are not counted at all.

Each item passed or missed has a definite value. Since it is our aim to find a developmental age (DA) comparable to the chronological age (CA), such values are expressed in days to be added to or deducted from the basic age (BA) The basic age is determined by the lower limit of the age group for which the basic series was constructed

To this basic age positively evaluated items are added, negative ones are deducted from it The value of each item is, however, not the same in each series as may be seen from the table on page 68

These values were gained by the following method We assume that the child gradually learns to pass the ten items of a series, and that when he has reached the exact BA he is still unable to pass any of the items for that age; further, that during the period which in our tests is considered a developmental unit, the child is still able to pass the items of the preceding period. We then conclude that the child learns to pass each

succeeding item after he has mastered the previous ones and that he requires an equal amount of time to learn each item We are well aware that this is an assumption, but it is necessary in order to evaluate our results quantitatively. At the exact CA of 2 ; 0 the ideally normal child can pass all the items of the

TABLE II

VALUES OF TEST ITEMS IN EACH SERIES

Series	Age of Subject	Basic Age	Each Item Counts
			days
I	0 , 0 to 0 , 0+29	0 , 0	3
II	0 , 1 to 0 , 1+29	0 , 1	3
III	0 , 2 to 0 , 2+29	0 , 2	3
IV	0 , 3 to 0 , 3+29	0 , 3	3
V	0 , 4 to 0 , 4+29	0 , 4	3
VI	0 , 5 to 0 , 5+29	0 , 5	3
VII	0 , 6 to 0 , 6+29	0 , 6	3
VIII	0 , 7 to 0 , 7+29	0 , 7	3
IX	0 , 8 to 0 , 9+29	0 , 8	6
X	0 , 10 to 0 , 11+29	0 , 10	6
XI	1 , 0 to 1 , 2+29	1 , 0	9
XII	1 , 3 to 1 , 5+29	1 , 3	9
XIII	1 , 6 to 1 , 11+29	1 , 6	18
XIV	2 , 0 to 2 , 11+29	2 , 0	36
XV	3 , 0 to 3 , 11+29	3 , 0	36
XVI	4 , 0 to 4 , 11+29	4 , 0	36
XVII	5 , 0 to 5 , 11+29	5 , 0	36

preceding stage but none of the next series When the same child is 2 ; 11+29 old he will be able to pass all the items of the series 2 ; 0 to 2 , 11+29 Consequently he will have learned to pass ten items in that period Assuming that all items require an equal amount of time, he will have spent approximately $360 \cdot 10 = 36$ days in learning each item Therefore a child with a CA of 2 ; 0 is credited with thirty-six days for each item of the third-year series which he passes successfully This also shows why failures in the basic series are not evaluated negatively. Examples of evaluations are given in Appendix I.

To properly evaluate the acceleration or retardation shown by the tests it is necessary to consider what the difference between CA and DA means for that particular age. It is clear that a difference of nineteen days is much more significant in a five-month-old than in a five-year-old We therefore do not express these differences in absolute figures but calculate, in analogy to the familiar IQ, the developmental quotient[292, 306]: DQ = DA/CA.

It follows that whenever the DQ is more than 1 there is acceleration, when it is less than 1, retardation; and when it is exactly 1, the CA = DA In how far deviations from DQ = 1 are within the boundary of normality cannot be said definitely since our experiments involving environmental differences have not been concluded Our experience so far leads us to assume any DQ between 0 9 and 1 1 as normal

The decision whether or not an item has been passed does not ordinarily present any difficulties. There are, however, cases where failure is not due to inability but to the fact that the item in question involves a type of behaviour beyond which the child has already developed The child, for instance, who will know how to put hollow sticks together (test for 1 , 6 to 1 , 11+29) will not be willing to beat them together (test for 1 , 0 to 1 , 2+29) In all such cases we are justified in considering the item passed for our quantitative evaluation.

Qualitative Interpretation

If our test results are to have practical significance we cannot be satisfied with the first part of our diagnosis, but must ask further in which field occurs the acceleration or retardation shown in the quantitative analysis. Before practical advice can be given an understanding of the nature of this deviation from the normal is as necessary as knowledge of its extent. Let us look at the following example a one-year-old boy showed a retardation which is evaluated at twenty-four days.

His DQ was 0 93 On the basis of quantitative results it cannot be decided whether or not this deviation has practical significance This can only be decided after it is known whether his retardation is evenly distributed and general or rather uneven and specific, also, in the latter case, which special ability is involved In order to determine this we shall have to find which items in each series were successfully passed The results for the above-mentioned boy are as follows

Boy 1001, CA 1 ; 0+15, DA 0 , 11+21, DQ 0 93

Series Item	0 , 8 to 0 , 10	0 , 10 to 1 , 0	1 , 0 to 1 , 3	1 , 3 to 1 , 6
1	+	+	−	−
2	+	+	+	+
3	+	+	+	−
4	+	+	−	−
5	+	+	−	−
6	+	−	−	−
7	−	−	−	−
8	+	−	−	−
9	+	−	−	−
10	+	−	−	−

This means that the child has passed and missed the following items

PASSED

Grasping two objects when sitting
Removing the cloth when sitting
Sitting without support
Crawling
Responding specifically to gestures
Attracting the adult's attention
Imitative drumming with one stick
Imitative beating with two spoons.
Grasping the same object twice
Rising to the sitting position
Coming to a standing position
Turning to the adult in surprise.

FAILED

Uncovering a hidden toy
Holding two cubes together
Opening a box
Pulling an object in reach with a string
Investigating the mechanism of a bell
Obtaining an object from behind a screen
Rubbing two sticks together
Organized ball play
Understanding a command
Remembering the contents of a box after 3 minutes
Remembering the chick after 3 minutes
Squeezing the ball with the chick.

Passed	Failed
Remembering the contents of a box after 1 minute	Taking a nest of cubes apart and putting it together
Imitative ringing of the bell	Grasping for a rusk behind the mirror
Standing without support	Observing a moving object
Holding an object when walking with support.	Holding an object while standing without support
Walking	Turning to the adult for explanation
	Understanding a prohibition
	Remembering the contents of a box after 8 minutes
	Looking for the chick after 8 minutes
	Imitative drumming with 2 sticks
	Preferring coloured figures
	Finding a rusk under a cube

This table shows at a glance that the child could pass practically all the items which involved control and movements of the body, even those contained in the series above the basic one, but that he was considerably behind for his age in any other field The items in which he failed may be classified in order to find the nature of the retardation, which procedure is simplified by the chart which is appended to this book This chart represents the normal development and contains, from left to right, the different stages covered by the tests from 0 ; 0 to 6 ; 0 There are seventeen stages in all, indicated by roman numerals From bottom to top the chart shows such mental and psycho-physical abilities as are covered symptomatically by the tests.

With the chart before us, let us return to the test results of our subject The series used for this child include IX, X, XI, and XII Of the basic series for his age, XI, our subject solved only items 2 and 3, which test bodily control Of the preceding series he passed only half, including those testing bodily control, one of those testing social reaction, and two testing learning ability. On the other hand the child failed in the

preceding series in the items involving manipulation of material, and all those involving thinking He failed even in the memory test of Series IX We may therefore conclude the child's bodily control is well developed, his social reaction and willingness to imitate are one stage behind, his memory from one to two stages, and his manipulation of material and thinking fully two stages

With the aid of the chart this qualitative diagnosis may be made quite as easily as the preceding quantitative diagnosis

The genetic psychologist will be able to draw still further conclusions from the above data Since the subject was so far advanced in bodily control it is probable that his retardation in manipulation of material is not caused by clumsiness Since, on the other hand, he failed on the memory test whereby he was supposed to use his own initiative in looking for his lost toy, it is possible that lack of initiative caused his failure in manipulation This assumption gains in probability when we consider the complete failure on all thinking tests for which a desire to solve the problems and an interest in relationships are prerequisites It is not to be assumed that the child had not had any contact with others since he did not fall down completely on social ability, though he was retarded in it There is still the possibility that he had had too few toys to play with and as a result had not accumulated any experience in dealing with materials

The fact that he was able to imitate and remember when dealing with the materials but had no interest in relationships leads to the conclusion that lack of mental spontaneity is this subject's main trouble Therefore much stress is to be laid on encouragement and training of memory This is the practical, pedagogic result of the test.

As further examples of the use of our chart and the type of conclusions to be drawn we submit the following analyses of other cases. The analysis is technically simplified by using a separate chart to record the results for each child Plus and minus signs, written in coloured pencil in the appropriate

spaces on the chart, indicate passing or failure. The dimension to which each test item belongs can now be ascertained immediately and the developmental profile can be computed directly from the chart. When the same child is tested again at a later date, the results may be written on the same chart with a differently coloured pencil * This enables us to note his progress at a glance

As further examples we give a comparison of two children of almost equal age but with significantly different abilities.

Girl 95, CA 0 , 6+29, DA 0 , 6+21, DQ 0 96

Series / Item	0 , 4	0 , 5	0 , 6	0 , 7	0 , 8
1	+	+	+	−	−
2	+	o†	+	−	−
3	+	+	+	−	−
4	+	+	−	−	−
5	+	−	+	−	−
6	+	−	−	+	−
7	+	+	+	+	−
8	+	+	+	−	−
9	+	o	+	−	−
10	+	+	−	−	−

Girl 107, CA 0 ; 6+13, DA 0 , 7+9, DQ 1 14.

Series / Item	0 , 4	0 ; 5	0 , 6	0 , 7	0 , 8
1	o	+	+	+	−
2	+	o	+	−	−
3	+	+	+	+	−
4	+	+	+	−	−
5	+	+	+	+	−
6	+	o	+	+	−
7	+	−	−	−	−
8	+	+	+	−	−
9	+	o	+	−	−
10	+	+	+	+	−

Girl 95 passed seven items of her basic series (0 , 6) but missed the following removing the cloth while in prone position, turning from

* Additional charts for recording test results may be obtained from the publishers

† o means "uncertain results"

back to side, and manipulating a stationary object with a moving one The first two test bodily control, the last manipulation of materials In the series for 0 , 5 she failed again on the items for bodily control raising head and shoulders when in dorsal position and raising head and shoulders with assistance She passed all items for the 0 , 4 series Consequently she was retarded in bodily control Unfortunately, there are two uncertain results in the 0 , 5 series, which were probably positive since she passed corresponding items in the more difficult series On the next higher series she passed two items, both testing social behaviour (playing peek-a-boo and taking a toy away from the adult) She was, therefore, somewhat advanced in social behaviour Since she lacked only one day of being 7 months old she should have passed more items of the 0 , 6 series than she did and she was generally somewhat retarded, mainly because of lack of bodily control

Girl 107 was somewhat advanced She passed all items but one on her basic series This one item was "seeking contact," and it is interesting to note that the only item she did not pass on the previous series was also a test of social behaviour (reflecting friendly and angry facial expression) In the series for 0 , 7 she again failed on the social test (playing peek-a-boo), but she passed all three items in which she had to obtain a toy (she reached for an object outside the bed, showing her interest in the object while demonstrating bodily control, she changed her position to reach a toy, again demonstrating her interest in an object even under unfavourable conditions, and she took a toy away from the adult which must again have been motivated by a strong interest in the object) Social contact did not play a part in determining this child's behaviour She was advanced in bodily control and passed the locomotion test for the eighth month, though she was somewhat retarded in her social contacts

We shall now analyse a somewhat retarded and a somewhat advanced child in the second year of life

Boy 1113, CA 1 , 7, DA 1 , 6+9, DQ 0 96

Item	Series XI (1 , 0 to 1 3)	XII (1 , 3 to 1 , 5)	XIII (1 , 6 to 1 , 11)
1	+	+	−
2	0	−	−
3	+	−	0
4	+	+	−
5	+	+	+
6	+	+	−
7	+	+	−
8	−	+	−
9	+	+	+
10	+	+	−

Boy 936, CA 1 , 4+20, DA 1 ; 5+21, DQ 1 , 06.

Series / Item	XI (1 ; 0 to 1 , 3)	XII (1 , 3 to 1 , 5)	XIII (1 , 6 to 1 ; 11)
1	+	+	−
2	o	+	−
3	+	+	o
4	+	−	−
5	+	o	−
6	+	+	+
7	+	+	−
8	−	−	−
9	+	−	+
10	+	+	−

Of the items of his basic test, Boy 1113 solved only two items, one involving memory (remembering the chick after 17 minutes), the other thinking (reaching an object with a stick) He failed to complete a number of the preceding test items walking without aid, holding an object while standing without support (bodily control), and imitatively squeezing the ball The latter is not important because he solved the more difficult test of imitation of the next series The boy is normal in his memory and thought development and retarded in everything else, especially in bodily control, a fact which probably influenced his other performances to some extent

Boy 936 presents a different picture He passed six test items of his basic series but failed in one (perhaps both) of the social items, in imitation and in receptive perception Nor did he pass the imitation test in the previous series However, he was advanced in manipulation of materials and solved these items on the succeeding series also His failure in imitation indicates lack of contact, not lack of skill, since he is advanced in both skill and thinking

Following are the analyses of three children of the next stage, one average, another greatly retarded, the third considerably advanced

Girl X, CA 2 , 5, DA 2 , 5, DQ 1 00

Series / Item	1 , 6 to 1 , 11	2 , 0 to 2 , 11	3 , 0 to 3 , 11
1	+	−	−
2	+	−	−
3	+	+	−
4	+	+	−
5	+	+	−
6	−	+	−
7	+	−	−
8	+	−	−
9	+	−	−
10	+	−	+

Boy Y, CA 2 ; 3, DA 1 , 11, DQ 0 86.

Series Item	1 , 6 to 1 , 11	2 , 0 to 2 , 11	3 , 0 to 3 , 11
1	+	—	—
2	+	—	—
3	—	—	—
4	+	—	—
5	+	—	—
6	+	—	—
7	+	—	—
8	+	—	—
9	+	—	—
10	+	—	—

Boy Z, CA 2 , 6, DA 3 , 0, DQ 1 25

Series Item	1 , 6 to 1 , 11	2 , 0 to 2 , 11	3 , 0 to 3 , 11
1	+	+	—
2	+	+	—
3	+	—	—
4	+	+	—
5	+	+	+
6	+	+	—
7	+	—	—
8	+	+	—
9	+	+	—
10	+	+	+

The first of these three children passed four of the items of her basic series, but failed on one of the items of the preceding group She presents a very clear picture Of her basic series she passed two language items and the one item passed on the succeeding series also was of this type She passed the memory test for her age as well as that for perseverance On the other hand she failed on all items which involved manipulation of materials This is the only item on which she failed in the series preceding the basic group She is a thoroughly normal child for her age, slightly advanced in language development and slightly retarded in manipulation of materials

Boy Y, who is two months younger than Girl X, passed none of the items for his basic age nor any of the items of the succeeding series He passed all items of the previous series with the exception of the language test, so that in his language development he is more than one stage behind Since he failed on only one item of the series preceding that for his basic age, he is still within the range of the normal, though retarded by several months

Boy Z is one month older than the girl and passed eight items on his basic test in addition to two of the succeeding series and all

the items on the preceding one The passed items of the higher series involve memory and language-thinking (picture interpretation) It is interesting to note that this child does not imitate building, though he is able to erect his own building, and that he does not follow instructions in sorting, though his contact with other individuals is adequate It is possible that we have before us a child that follows his own initiative and interests to the exclusion of others In any case, the child's mental development is especially good

The following is a comparison of three older children, one who was average, one slightly retarded, and one very advanced

Girl A, CA 3 , 8, DA 3 , 7, DQ 0 98

Series / Item	2 , 0	3 , 0	4 , 0
1	+	+	+
2	+	+	−
3	+	+	−
4	+	−	−
5	+	+	−
6	−	−	−
7	+	+	−
8	−	−	−
9	+	+	−
10	+	−	+

Girl B, CA 3 , 4, DA 3 , 0, DQ 0 90

Series / Item	2 , 0	3 , 0	4 , 0
1	+	−	−
2	+	−	−
3	+	−	−
4	+	−	−
5	+	+	−
6	+	−	−
7	+	−	−
8	+	−	−
9	+	−	−
10	−	−	−

Boy C, CA 3 , 0. DA 3 , 10, DQ 1 27

Series / Item	2 , 0	3 , 0	4 , 0
1	−	−	+
2	+	+	−
3	+	+	+
4	+	+	−
5	+	+	−
6	+	−	−
7	−	+	−
8	+	+	−
9	+	+	−
10	+	+	−

Girl A was about average for her age, passed six items in her basic series and two in the next, but missed two in the preceding series. Her failures were mainly items covering language, while she passed tests for understanding rules of a game and completing a puppet for the 4 , 0 series Her only retardation, therefore, was a linguistic one

Girl B was more retarded for her age She passed only one item

of her basic series which involved memory and none of the next series, but she passed all the items of the preceding series except the form-board Her development was decidedly that of the preceding level rather than of the level corresponding to her chronological age

Boy C passed eight of the items of his basic series and two of the next He missed only two of the items in the preceding series He was advanced generally, understood the rules and commands included in the 4 , 0 series, but was slightly retarded in bodily control, as shown by his failure on those items in his basic and the preceding series

These analyses serve to illustrate a number of normal cases Experience has shown that in more or less abnormal cases a diagnosis of the abnormality was possible at an early age and could be made with considerable accuracy Such cases are analysed in another study [45a]

The Developmental Profile

The profile as a means of expressing test results in graphic form has been used since Rossolimo [257] The possibility of thus presenting in a picture data which have already been expressed in words or figures has practical significance because such a presentation can be easily grasped and understood We have therefore developed such a profile for use with our tests

The first thing such a profile must show is the developmental level of the subject in each of the six categories shown in our chart and the relation of retardation and acceleration to each other These categories are: sense reception, bodily control, social behaviour, learning, manipulation, mental production We count separately how many items the child has passed in each of these six fields in order to record this in our profile

The ideally normal child would solve the following number of items at the end of the first month of life.

Sense reception	6
Bodily control	3
Social reactions	0
Learning	1
Manipulation . .	0
Mental production	0

At the end of the second month these numbers would be:

Sense reception	12 (6 from series I, 6 from II)
Bodily control	5 3 „ „ „ 2 „ „
Social reactions	1 0 „ „ „ 1 „ „
Learning	2 1 „ „ „ 1 „ „
Manipulation	0
Mental production	0

Continuing this until 6 , 0 we find the following numbers of items in the six fields which should be passed at different ages:

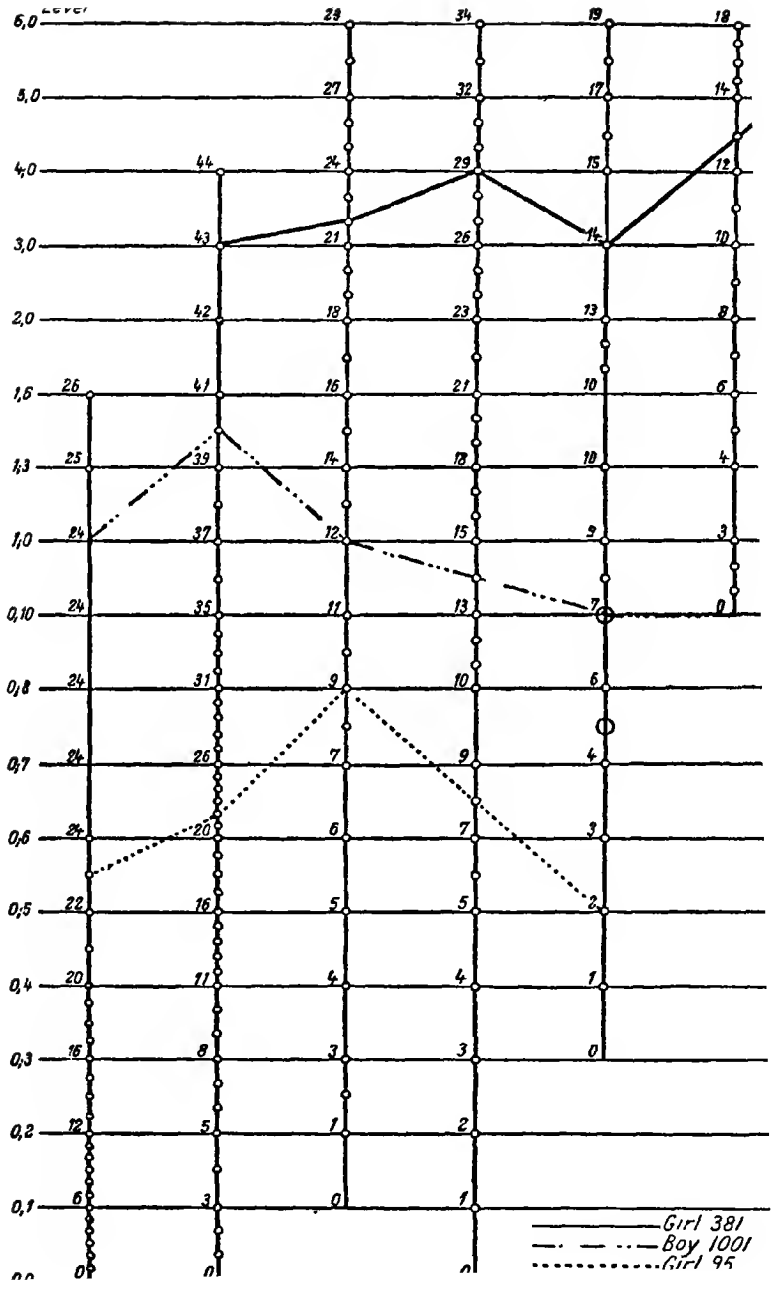
TABLE III

NUMBER OF ITEMS TO BE PASSED AT EACH AGE-LEVEL

Up to Age	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,10
Sense reception	6	12	16	20	22	24	24	24	24
Bodily control	3	5	8	11	16	20	26	31	35
Social reactions	0	1	3	4	5	6	7	9	11
Learning	1	2	3	4	5	7	9	10	13
Manipulation	—	—	—	1	2	3	4	6	7
Mental production	—	—	—	—	—	—	—	—	—

Up to Age	1,0	1,3	1,6	2,0	3,0	4,0	5,0	6,0
Sense reception	24	25	26	—	—	—	—	—
Bodily control	37	39	41	42	43	44	—	—
Social reactions	12	14	16	18	21	24	27	29
Learning	15	18	21	23	26	29	32	34
Manipulation	9	10	10	13	14	15	17	19
Mental production	3	4	6	8	10	12	14	18

This table is graphically presented in the form used for the profile The developmental level of each stage is represented by a horizontal line while the vertical lines represent the individual categories. The distance between two successive levels is divided in as many parts as there are items covering this category in that particular series The first month contains six items covering sense perception, three on bodily movements, one on learning, none on social behaviour, none on manipulation and mental production These latter categories do not begin until 0 , 1, 0 ; 3 and 0 ; 10 respectively In the same manner sensory reception stops at 1 , 6 and bodily control


6,0
5,0
4,0
3,0
2,0
1,6
1,3
1,0
0,10
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
Girl 381
Boy 1001
Girl 95

at 4 ; 0 on the profile blank because items covering these categories are lacking in the series from then on.

The number of items normally passed as shown in the above table has been added at each level in the profile blank In cases where at a certain level no items for one of the categories appear, the same number is repeated at more than one successive level if later tests of the same category reappear It is easy to see from the profile blank that in such a case the specific stage of development in that field cannot be tested for that age-level

Returning to the above-mentioned case of B 1001 (CA 1 , 0+15, DA 0 , 11+21, DQ 0 93) we may now order the various items passed and missed under the six categories of our chart We begin with the highest level at which all items were passed, in this case series VIII (0 , 8) From the profile we read that at the completion of this stage the following numbers should be passed· sense reception 24, bodily control 31, social behaviour 9, learning 10, manipulation 6 These numbers, of course, refer to items in previous series which are assumed to be passed since the more difficult items in each category were successfully passed in series VIII To these figures we add the items passed in each category belonging to the succeeding series, and so find the following totals:

TABLE IV

RESULTS FOR B 1001

Category	In Series VIII	In Next Series	Total
Sense reception	24	0	24
Bodily control	31	9	40
Social reactions	9	3	12
Learning	10	4	14
Manipulation	6	1	7
Mental production	0	0	0

The profile for this subject is now drawn through the points on the profile blank which represent the total number

of items passed in each category In this case we have the difficulty of where to register the performance on sense reception since the same number of items covers five levels We solve this by selecting the level corresponding to the CA, that is, 1 ; 0 (see profile on page 80)

Knowing that on the basis of the CA this boy's DA should be around 1 ; 0 we can read from his profile that his sense reception and social behaviour are approximately normal, that his acceleration in bodily control is considerable, that his learning and manipulation are slightly retarded, and his mental production significantly so. These conclusions were drawn previously from our quantitative analysis; but the profile presents an aid to visualization, especially when several children are to be compared In the sample profile two other cases are presented which permit a comparison with B 1001.

CHAPTER III

CONSTRUCTION AND STANDARDIZATION OF THE TESTS

The Construction of the Tests

The basis on which our test series were developed has been discussed in the Introduction The children were systematically placed in everyday situations chosen for their ability to stimulate certain characteristic responses which could be observed quickly and certainly and which had symptomatic significance. We knew these situations from many years of experimental work as well as from 101 observations extending over twenty-four-hour periods made on 69 children in the first, 16 in the second, and 4 in each of the next years of life The information gained in previous work was supplemented by a large number of preliminary experiments with test items These resulted in a revision of many items because certain weaknesses in the test situation became evident from time to time Not only should each test item stimulate the expected symptomatic behaviour in the shortest time and with the greatest certainty possible, but the situation should be chosen so that the child would react in the symptomatic fashion even when not in a pronouncedly positive mood, and even when in the more or less disturbing presence of an unfamiliar tester. How much effort is required to build a series of tests which satisfy all these demands may be gathered from the number of items which formed part of our preliminary experiments but were not used in our final series In the first-year series 25 items were discarded, 14 in the second year, and 21 in the third to fifth years Items omitted are given in Appendix II

Reasons for eliminating certain items were as follows:

1. TECHNICAL REASONS

In the two- and three-year-old series the ability to think in terms of tools is tested in the following manner A rusk is placed on the dresser so that the child can see it but not reach it A chair has been placed in the child's visual field He is invited to help himself to the rusk and has to push the chair towards the dresser and climb on it We attempted to adapt this test to a higher developmental level by placing the chair outside the field of vision, but found that this disturbed the unity of the situation While in the first situation the child uses only the chair as a means of reaching his goal, in the second situation there is an uncontrollable multitude of ways to get to the desired object. One child climbed on the dresser by way of the washstand, another used a stick which he found somewhere in the room, etc The use of the chair is in no way preferable to these other methods, and it was therefore decided to eliminate this test because the situation could not be adequately controlled.

2. THE ITEM DOES NOT FIT IN WITH THE CHILD'S TENDENCIES

Tests of bodily control, such as walking on a straight line, walking on the toes, standing on one foot, were omitted because children showed great reluctance to undertake them It was difficult to enter such items into the test situation except at the end, since getting up during a test which requires the child to sit at a table and work with materials disturbs the natural situation for him and interferes with his behaviour Furthermore, one of the first rules to be observed in the making of a test is that each item should be consistent with a functional need or desire of the subject. The child, of course, has no need to get up from his table to perform acrobatic stunts If the test is given in the kindergarten it is possible to interest the child in this sort of test by making it part of a group game, but this cannot be done by an unfamiliar adult tester in the course of an individual test.

3. THE TEST SITUATION DOES NOT STIMULATE THE DESIRED RESPONSE

The child understands the special relations expressed by the words "larger" and "smaller" before he understands the words; for example, when he begins to put hollow cubes together early in the second year. A practical understanding of dimensional relations is a matter of maturation, not environment. We had expected that our test in colour-matching would give similar results as a test of the child's colour concept independent of language development. To this end we had prepared a round cardboard of 40 cm diameter on which a wreath of flowers was pasted A circular green band 8 cm. wide with a diameter of 36 cm represented the leaves, while at regular intervals pairs of identically shaped flowers appeared in the following eight colours Red, orange, yellow, green, blue, violet, black, and white One of each pair was cut out and these were given to the child one by one with the instruction to put them in the wreath so that always the "same" would be together This problem was solved by 10 per cent of the two-year-olds, 60 per cent of the three-, and 90 per cent of the four-year-olds Consequently this item might have been included as a test for the three-year level Nevertheless it was decided to leave it out because it was clear from the children's behaviour that this was a test not of colour concept but of understanding instructions The fact that these percentages of correct solutions coincided with those for the sorting test, which involves among other things the ability to finish a task which requires a long time, is a further indication of this

4. THE SOLUTION DEPENDS TOO MUCH ON ENVIRONMENT

We made the following experiment: Two cubes whose volumes were in the ratio 1 : 4 were given the child The experimenter pointed to one, then to the other cube, and asked if it were larger or smaller than the first. Only 30 per cent

of the children between 2 ; 6 and 3 ; 0 gave correct answers. Only after 3 , 0 could we consider the verbal understanding of "large" and "small" as established Similar results were obtained in naming colours Seventy per cent of the three- and four-year-olds could name black and white when asked to name the colours of the flowers in the wreath referred to above In the fifth year we found red correctly identified On the other hand we know that Bubi Scupin, as well as the subjects of various other diaries, verbally differentiated between "large" and "small," and used the names of the primary colours as early as the first half of the third year of life This difference is explained by the fact that proper use of these expressions depends to a high degree on hearing them used by others It had been our intention to use these items in testing the conscious concepts of size and colour in children, but since they were found to be simple tests of knowledge of vocabulary they were not incorporated in the test series

5 PERFORMANCES ARE SUBJECT TO CONSIDERABLE INDIVIDUAL DIFFERENCES

In our preliminary experiments with the sorting test we had noted the time consumed in sorting two hundred leaves of coloured paper as well as the time during which children who did not complete the job occupied themselves with it This was done in an attempt to use this information as a measure of concentration or perseverance However, it was found that, although the time required to sort the slips of paper decreased for the older children, individual differences inside the age groups were greater than the differences between the averages for different groups The time required was sixteen minutes for the two-year-olds, thirteen minutes for the three-, and ten minutes for the four-year-olds, while the individual differences ranged up to twenty minutes. The distribution was approximately the same for all ages.

6 RESULTS DO NOT COMPLY WITH STATISTICAL REQUIREMENTS

This case is fully discussed in a later paragraph.

Finally, it may occur that a suitable test item is excluded from the final series because there is no room for it For each series twelve items were included in our main experiment for standardization. Two of these had to be eliminated in case they were all found suitable In that case it was a matter of degree of suitability, and the differences were often quite small

The Standardization of the Tests

STATISTICAL REQUIREMENTS OF THE TESTS

It was the purpose of our preliminary experimentation to find situations which would involve types of behaviour which we wanted to test and to find out how suitable such situations were as test items The degree to which a situation complies with the statistical requirements of a test item is an important factor

In order to make a suitable test item a situation must be satisfactorily solved by a relatively high percentage of children of the age for which the item is intended. Although not too few children should be able to master it, if too many are able to do so it would become impossible to discover those whose performance is poor Furthermore, the item should not be passed by too many children of the preceding level, but there should be a sudden increase in the percentage of successful solutions from the preceding stage to the stage for which the item is intended

The minimum percentages which are considered sufficient to include an item in a test differ in the literature. Two solutions to the problem occur most frequently One is to take children who on the average have completed the developmental stage in question (such as the third month of life) and to assume that

50 per cent of them are normal, 25 per cent below, and 25 per cent above normal An item is included when it is passed by the normal and above-normal children—that is, by 75 per cent * The other method is to take children whose average age is the middle of the period in question (for instance, 0 ; 2+15) and to assume that at that point only half the items can be solved, so that 50 per cent is the decisive measure. Since we chose our children so that their average age fell in the middle of each period we should have to regard items solved by 50 per cent of them as suitable After much experimentation, however, we abandoned this viewpoint for the following reasons We had to consider the fact that the performance of children in practical test situations would be below that of those tested under the experimentally optimal conditions of our standardization procedure In order to avoid an apparent retardation of all children to be tested by this method we had to be a little more liberal in the selection of test items Since there was no precedent on which to base our changed procedure, we assumed somewhat arbitrarily that each item should be passed by 66 per cent of all children of a given age tested by us before being included in our final series This was done on the basis of many years of observation; that we did not make a miscalculation is shown by the fact that in all instances which have thus far come to our attention a medium DQ of 1.0 was obtained

Even though optimal performances are avoided in the Viennese test series, an adult or older child concentrates much more on a test than a younger child whose every situation in life depends on numerous *imponderabilia* For the sake of these, which make the everyday situation of the small child appear less advantageous than the situation during standardization, we have to expect inferior performances in the

* "Normal," of course, is here merely a statistical fact.

average test procedure to that in the hands of trained child psychologists.

THE SELECTION OF CHILDREN USED FOR STANDARDIZATION

On the basis of preliminary experiments a number of items could be eliminated as undoubtedly statistically unsuitable. From the remaining items we selected twelve for each age-level which were given to three groups of children. some of the corresponding age-level, some of the preceding, and some of the succeeding levels

Children used in these tests were largely taken from the poorer population of Vienna Infants up to two years old were taken mostly from among the young inmates of the Municipal Home for Children and the Central Home for Children of the City of Vienna, those of the first month of life from the Lower Austrian State Maternity Hospital in Vienna; those from the third to sixth years from the Municipal Home for Children and from municipal kindergartens Six-year-olds were selected from the municipal schools

The test series for the first year of life were given to 20 children of each stage, making a total of 220 children, including those of the next higher stage Those for the second year were given to 25 children of each stage, making a total of 125 For the third to fifth years we used 95 children, testing 25 children of corresponding age for each series, 10 children of the group preceding those for the third and 10 of that succeeding those for the fifth year The sixth-year test was standardized on 40 four-year-olds, 115 five-year-olds, and 95 six-year-olds, a total of 250 children

We attempted to choose the children so that their ages were evenly distributed over each age-level. This was done by subdividing each stage in three or four parts, and by testing an equal number of children in each part An example of this method follows:

TABLE V

AGE DISTRIBUTION OF CHILDREN OF THE NINTH AND TENTH MONTHS

Age	0,8 to 0,8+19	0,8+20 to 0,9+9	0,9+10 to 0,9+29	Total
Number	7	6	7	20

Only healthy children who were in a favourable condition for testing and who showed no irregularities were used

THE RESULTS

The suitability of each item was definitely established as a result of these tests It was, of course, not to be expected that many items would be solved by exactly 66 per cent of the children The usual standardization procedure is to use each item for that group whose percentage of successful solutions approaches most nearly the 66 per cent mark If, for instance, a certain item is completed by 46 per cent of children of 1 , 3, 54 per cent of 1 ; 6, and 72 per cent of 2 ; 0, this item is usually incorporated in the 2 ; 0 series, since 72 per cent is nearer to 66 per cent than is 54 per cent

Here again we have deviated from the usual procedure by keeping in mind our psychological starting-point We do not believe that any test item is suitable for any age provided it is solved by a certain percentage of the children We know from experience that for each stage of development only a certain group of items is to be considered and each item was therefore tried out on a certain age group If in the above example the item was supposed to be used in connection with the 1 ; 6 level, we would not assign it to the 2 ; 0 level on the basis of percentages obtained, but omit the item altogether and replace it by another which would meet our psychological as well as our statistical requirements This is an example of how we have attempted to do exact work without sacrificing psychological understanding to statistical rigidity.

By the above method we obtained percentages which ranged

from 50 to 82 More and less difficult items compensated each other so that the averages of all items in each series were always close to 66 per cent. Table VI gives an example of such compensation.

TABLE VI

PERCENTAGES FOR THE 3, 0 SERIES

Test Item	Age of Children		
	2, 0 to 2, 11	3, 0 to 3, 11	4, 0 to 4, 11
Carrying glass of water	16	64	76
Building	10	64	84
Unhooking	8	60	76
Sorting	16	64	72
Picture-interpretation	24	72	84
Judgment	14	64	84
Verbal formulation	8	60	80
Drawing circle	12	68	100
Finding three objects	22	56	84
Repeating eight syllables	6	60	88
Averages	14	63	82

That this compensation has been successful for all levels is shown in Table VII, which gives the average percentages of successful solutions for each series

TABLE VII

PERCENTAGES FOR EACH SERIES

Series	Percentage	Series	Percentage
0, 0	69 5	0, 10	69 4
0, 1	69 9	1, 0	66 6
0, 2	69 9	1, 3	68 2
0, 3	69 4	1, 6	64 6
0, 4	66	2, 0	64
0, 5	67 3	3, 0	63
0, 6	65 4	4, 0	66
0, 7	65	5, 0	69·9
0; 8	69·2		

The standardization of the tests brought to a close the problem of their construction It should be emphasized that these tests should not be applied mechanically to other children in totally different circumstances, but should be used with caution and consideration of all factors which may influence the results as shown in the preceding paragraphs.

PART TWO

THE VIENNESE TESTS

CHAPTER I

THE TESTS FOR THE FIRST YEAR OF LIFE

BY

LISELOTTE FRANKL AND KAETHE WOLF

I

THE FIRST MONTH

1 Turning the head when the cheek is touched (feeding response)
2 Clutching an object which touches the hand
3 Reacting positively to being picked up
4 Reacting positively to a mild noise
5 Looking at a subdued light
6 Reacting to a shadow
7 Reacting negatively to unpleasant tactual stimulation
8 Reacting unspecifically to the cardboard cover
9 Lifting the head briefly while in prone position
10 Opening the mouth after withdrawal of the source of food

Suggested Order of Presentation

9 7 2 10 1 5 4 8 3 6

Abbreviated Procedure

9 7 10 6

(*Each item counts 3 days*)

DESCRIPTION OF TEST ITEMS*

1. *Turning the head when the cheek is touched (feeding response)*[128]

The experimenter (E) touches the child's (S) cheek lightly with his index finger. If this does not call forth a response the stimulation may be repeated with a slight finger-stroke across the cheek.

* Numbers in parentheses refer to the list of materials given at the end of the chapter. + indicates the reaction intended and evaluated positively.

+ The child turns his head It makes no difference whether he moves it towards or away from E's hand; important is that lip movements, opening the mouth, or sucking movements occur as well as head movements In some cases the lip movements precede Sucking alone is not counted positively.

2. *Clutching an object which touches the hand*[331]

E puts his finger in the open palm of S's hand.

+ S clutches the finger as soon as it touches his hand and holds it tightly.

3 *Reacting positively to being picked up*

E lifts the child up when he cries or shows other signs of displeasure and holds him on his arm at an angle of about 45°

+ S ceases crying as soon as lifted up or soon thereafter

4 *Reacting positively to a mild noise*

E shakes a rattle (1) near the child's crib

+ S quiets down during or immediately after the noise As in item 3, it is a prerequisite that the child cries This will usually occur towards the end of the testing period

5. *Looking at a subdued light*[125]

A flashlight (18) is held about one metre from S's face in his field of vision. The room has been slightly darkened either by a cloth hung over the bed or by a towel over E's arm, who uses his other hand in bringing the light into the child's field of vision

+ The child's eyes are held by the light for a few seconds.

6. *Reacting to a shadow*

E bends over the crib so that his shadow covers S's field of vision He then moves away slowly.

+ S's eyes are held by the moving shadow for a few seconds.

This item should be repeated once or twice to avoid accidental responses.

7. *Reacting negatively to unpleasant tactual stimulation**

E rubs the child's nose with a piece of cotton wool (13), going through the movements of cleaning it without touching the mucous membrane

+ *a* If S was not moving his head at the beginning of this test he now moves it sideways or any other way

+ *b*. If the head was in motion at the beginning of this item the movement stops suddenly, increases considerably or changes noticeably in direction

This test may be repeated once if the results are not clear.

Frequent repetition, however, may result in negative adaptation.

8. *Reacting unspecifically to the cardboard cover*[48]

The cardboard (9) is bent in the middle and put over the child so that the fold is right over his nose.

+ S makes violent movements with various parts of the body which may be observed by following the movements of the cardboard cover.

9. *Lifting the head briefly while in prone position**[46]

The child's arms are bent on each side of the head and close to it, while the face touches the pillow.

+ S lifts his head, if only for a brief moment.

In case of failure it may be well to repeat this test with slightly changed position of the arms, since much depends on that.

10. *Opening the mouth after withdrawal of the source of food*[128]

S is in the normal feeding position, but after a few minutes the feeding is interrupted.

* All items accompanied by an asterisk are taken from Hetzer–Wolf, *Babytests*,[132] translated in Charlotte Buehler's, *The First Year of Life*.[44]

+ S moves the head towards the breast or bottle and tries to grasp it again with open mouth. Since giving this test may involve difficulties in the case of breast-fed children, it is permissible to ask the mother how the child reacts when the breast is withdrawn.

II

THE SECOND MONTH

1 Turning the head towards a noise
2 Listening to a bell
3 Reacting specifically to four acoustic stimuli
4 Staring at a light
5 Following a moving object with the eyes
6. Moving object followed outside the field of vision with the eyes
7 Reacting unspecifically to the cloth
8 Keeping the head erect when lifted up
9 Reacting positively to the human voice
10 Reacting specifically to the feeding position

Suggested Order of Presentation

6 8 4 2 3 5 1 7 9 10

Abbreviated Procedure

8 4 3 10

(*Each item counts 3 days*)

Description of Test Items

1. *Turning the head towards a noise*

A rattle (1) is shaken vigorously beside the child's crib but outside his field of vision E should not be seen by the child

+ The child immediately turns his head in the direction of the noise.

2. *Listening to a bell*

A small bell (23) is sounded for 30 seconds at a half-metre distance from the child. Neither bell nor E should be in the child's field of vision.[46]

+ The child's movements are inhibited for a few moments or the head is turned towards the sound.

3. *Reacting specifically to four acoustic stimuli*[201]

At intervals of 30 seconds four acoustic stimuli are presented: a toy clacker (3), a whistle (5) as a long tone and as a series of short tones with one-second intervals, beating on wood (4) with one-second intervals. Each sound is to be presented for 30 seconds unless S turns away from it sooner. E must remain hidden.

+ Various responses are possible. The essential thing is that the reactions to different sounds are clearly distinguishable although we cannot expect a characteristic response to each sound.

4 *Staring at a light*

A flashlight (18) is brought into the child's field of vision at a distance of 25 cm.

+ S stares at the light.

5 *Following a moving object with the eyes*[125]

A skein of red wool (16) is held approximately 25 cm * from the child's face. As soon as his eyes are fixed on the wool it is slowly moved sideways and back while care is taken that it remains within the field of vision at all times.

+ The child's eyes follow the movement sideways and back once if only after several attempts.

6 *Moving object followed outside the field of vision with the eyes*

E bends over the child and moves his head, which should be in the child's field of vision about 50 cm from his face, slowly towards the upper end of the crib and beyond that.

+ S follows the movement with the eyes by bending the head back. It is immaterial how far the eyes follow the movement; it is important whether the head be moved backwards while the child remains in the normal dorsal position.

* Note 1 inch = 2½ cm
1 cm = 0.4 inch

7 *Reacting unspecifically to the cloth*[48]

The child's face is completely covered with a cloth (14) while he is in the dorsal position

+ The whole body makes unspecific movements without succeeding in freeing itself from the cloth.

8 *Keeping the head erect when lifted up**

E brings the child into a vertical position by seating him on one hand while supporting his head and shoulders with the other The support of the head is slowly withdrawn

+ The head is kept erect for a few seconds

9 *Reacting positively to the human voice*[129]

E bends over the child when he shows mild displeasure and talks to him in a medium tone of voice for about 30 seconds

+ S stops crying completely while E talks to him or immediately thereafter.

10 *Reacting specifically to the normal feeding position*[128]

S is brought into the feeding position, either on the lap of the experimenter in the case of breast-fed infants or turned sideways in bed with a cloth under his chin in the case of bottle-fed babies

+ The child reacts specifically by opening the mouth, turning the head sideways, sucking, perhaps by quieting down or by expressing impatience Though not always all specific reactions can be observed, one will hardly suffice to show a definite response

III

THE THIRD MONTH

1 Searching head movements during a prolonged sound
2 Fixating a distant object
3 Looking around while being carried
4 Following a moving object with the eyes
5 Listening to the rattle while in prone position
6 Holding the head up while in prone position
7 Experimenting movements
8 Returning the glance of the adult with smiling or cooing
9 Cooing
10. Looking for a disappeared object

Suggested Order of Presentation

6 5 7 2 3 8 4 1 9 10

Abbreviated Procedure

6 7 8 10

(*Each item counts 3 days*)

Description of Test Items

1 *Searching head movements during a prolonged sound*[*201]

The arrangement is the same as in II, 2

+ S moves the head without showing preference for the direction from which the sound is heard The eyes usually remain fixed

2 *Fixating a distant object* (*enlargement of the field of vision*)

A skein of wool (16) is brought into the child's field of vision at a distance of about 1 metre from his face As soon as he focusses on the wool it is lifted up slowly and moved backwards as far as the child's eyes will follow it

+ S follows the wool with his eyes until it is about 2 metres away

3. *Looking around while being carried*

E takes the child on his arm in such a manner that his eyes are not turned towards the experimenter's face but towards the other side of the room In this fashion S is carried around for about two minutes.

+ S looks at the objects in the room

4 *Following a moving object with the eyes**

Same arrangement as in II, 5, except that a rattle (1) is used instead of the wool

+ The child's eyes follow the rattle in its sideways movements at least once.

5 *Listening to the rattle while in prone position*

The position of S is the same as in I, 9 A rattle (1) is shaken about 25 cm from his head

+ *a* If the child has already raised his head he now raises it higher or turns it towards the source of the noise

+ *b* The child raises his head on perceiving the noise

6 *Holding the head up while in prone position**

Same arrangement as in I, 9

+ S raises his head a few inches and holds it up for at least 30 seconds

7 *Experimenting movements**

These are spontaneous movements and should be observed in the course of the testing procedure

+ Experimenting movements are made which differ from the impulsive movements of the one-year-old in being slower They frequently are repeated carefully with all signs of attention.[45]

8. *Returning the adult's glance with smiling or cooing**[43]

E bends over the child and looks at him from a distance of about 25 cm.

+ S looks at the experimenter and reacts with a smile or with cooing (Fig 1).

9 *Cooing**

A spontaneous reaction which should be observed in the course of the testing situation If it does not occur then, the mother or nurse should be questioned as to its occurrence

+ Cooing sounds are made

10 *Looking for a disappeared object (perseveration)**[131]

The skein of wool (16) is brought into the field of vision at a distance of 25 cm from the child's face It is suddenly moved sideways out of his field of vision

+ S turns his head in the direction where the object disappeared and looks in that direction for a few seconds.

IV

THE FOURTH MONTH

1 Looking for the source of a sound
2 Reacting to an optical rather than to a simultaneous acoustical stimulus
3 Feeling of objects
4 Examining an object visually
5 Following a moving object with the eyes when in prone position
6 Holding head and shoulders erect while in prone position
7 Moving arms and legs over the under-surface while in prone position
8 Reacting negatively when the experimenter stops playing
9 Reacting to the mask
10 Holding the rattle

Suggested Order of Presentation

6 7 3 10 1 2 9 8 4 5

Abbreviated Procedure

6 3 1 9

(*Each item counts 3 days*)

Description of Test Items

1 *Looking for the source of a sound**

The rattle (1) is used as in II, 1, while E remains hidden + S first looks round, finally turns the head towards the source of the sound, and looks in that direction Attention and tension characterize this as a purposive movement

2. *Reacting to an optical stimulus rather than to a simultaneous acoustical one*[201,125]

While the rattle (1) is shaken beside the bed so that S cannot see it, a skein of wool (16) is made to appear on the other side

of the bed without being in the child's line of vision E must remain hidden.

+ S turns head several times in both directions but finally turns to the wool To avoid accidental solutions the experiment should be repeated with a reversed position of both stimuli

3 *Feeling of objects*[*46, 44]

This situation usually occurs normally in the course of the testing procedure E can often observe that the child moves his hand over the blanket or repeatedly touches its border. If S lies close to the railing of the crib he will often touch that railing and feel it If none of these types of behaviour occur during the test the experimenter may offer S an object such as a ball (20) or a cardboard (11) by holding it in such a position that the child's hands touch it in the course of their experimenting movements

+ S passes his hands over the object The movement is slow and S watches it carefully

4 *Examining an object visually*[131]

A larger object, such as the coloured ball (20), is brought into the child's field of vision at a distance of about 25 cm from his face

+ S does not stare at the object but lets his eyes wander back and forth over it

5 *Following a moving object with the eyes while in prone position*

After bringing S to the prone position, E slowly moves a larger object, such as the rubber doll (19), back and forth in the child's field of vision at a distance of about 15 cm from his face

+ S follows the movements of the doll with his eyes It suffices when he follows it once from one side to the other.

6 *Holding head and shoulders erect while in prone position**

S is brought into the same position as in I, 9 and III, 6.

+ Head and shoulders are raised from the under-surface. S raises himself up on his forearms.

7 *Moving arms and legs over the under-surface while in prone position*

Same position as in IV, 6 Legs and arms should have sufficient room to move.

+ S moves arms and legs over the under-surface Kicking the legs does not suffice, but the hands and legs both should be moved back and forth over the under-surface. This can best be observed by obstructing these movements with a cardboard or another solid object

8 *Reacting negatively when the experimenter stops playing**[43]

E occupies himself with the child, looks at him, talks and plays with him, and suddenly moves away from the crib.

+ S reacts negatively, begins to cry or shows signs of displeasure in other ways He also may follow the experimenter with the eyes as E turns away.

This type of behaviour can usually be observed in the course of the procedure

9. *Reacting to the mask**[47]

E holds his face at about 50 cm. from the child's and looks at him quietly for 30 seconds Turning away, E puts on a mask (17) and returns to his former position

+ A change takes place in the child's behaviour as soon as E has put on the mask. Negative reactions, such as frowning, crying, count as well as being startled, or a change in motor

behaviour such as increase or inhibition of bodily movements.

10. *Holding the rattle*

S is given the rattle (1)

\+ S holds the rattle without dropping it immediately.

V

THE FIFTH MONTH

1 Looking at a coloured paper longer than at a white one
2 Looking at an object while holding it
3 Grasping a touched object
4 Stretching the arms towards an object in view
5 Attempting to remove the cloth while in dorsal position
6 Lying supported only by the palms of the hands
7 Raising head and shoulders with support
8 Following the movements of the adult in the room
9 Reacting to the novelty of a situation
10 Manipulating an object

Suggested Order of Presentation

6 7 2 4 8 9 5 3 10 1

Abbreviated Procedure

6 2 9 3 10

(*Each item counts 3 days*)

Description of Test Items

1. *Looking at a coloured paper longer than at a white one*[125]

A white piece of cardboard (10) is held in the child's line of vision at a distance of about 25 cm until S pays no further attention to it The red cardboard (11) is then held in the same position for as long as the child's interest lasts

+ *a* The child looks at the red cardboard longer than at the white

+ *b* S is more active in his reactions to the red, looks at it more intently, stretches his arms out towards it

A combination of both reaction forms may occur.

2. *Looking at an object while holding it**

S is given the rattle (2).

+ S looks at the rattle while manipulating it and follows with the eyes the movements he makes with it

3. *Grasping a touched object**

The rattle (2) is held in such a position that the child's finger-tips touch it

+ The rattle is grasped after the finger-tips have touched it.

4 *Stretching the arms towards an object in view**

The ball (20) or the rattle (1) is moved within grasping distance of the child and his attention called to it

+ S moved his hands towards the object, often with outstretched fingers or with fists clenched (Fig 2)

5 *Attempting to remove the cloth while in dorsal position**[48]

A cloth (14) is put over the child's face so that it completely covers it

+ S makes different directed movements to remove the cloth without actually succeeding Such movements include attempts at grasping the cover, grasping in the air, violent movements of the body and turning round.

6. *Lying supported only by the palms of the hands**

S is placed in the same position as in I, 9

+ *a* Head and shoulders and the upper part of the body are raised from the under-surface so that S is supported only by the palms of the hands

+ *b* S moves one arm from the under-surface so that he is supported only by one arm.

7 *Raising head and shoulder with support*

E supports with the hand the lower part of the child's back and lifts him a little from his horizontal position.

FIG. 1.—Returning the adult's glance with smiling (III, 8)

FIG. 2.—Stretching the arms towards an object in view (V, 4)

FIG. 3.—Raising the head and shoulders with assistance (VI, 6)

FIG 4 - Reflecting friendly facial expression (VI 7)

FIG 5 — Reflecting angry facial expression (VI, 7)

FIG 6 —Defence reaction to the withdrawal of a toy (VI, 10)

+ S shows a tendency to raise himself further by not only holding his head up but attempting to raise it further.

8 *Following the movements of the adult in the room*

E bends over the child, plays with him for a few moments, then leaves the crib and goes about in the room

+ S follows with the eyes E's movements, if only for a few moments

9 *Reacting to the novelty of a situation**

E carries S into another part of the room and bends over with him so that his field of vision appears altogether different

+ S looks round with active interest.

10 *Manipulating an object**[46, 44]

S is given the rattle (2)

+ S holds the object firmly, even if not actively grasping it, and moves it about

VI

THE SIXTH MONTH

1 Distinguishing between an object and its environment
2 Distinguishing between the bottle and a rubber doll
3 Grasping an object in view with one hand
4 Removing the cloth while in dorsal position
5 Raising head and shoulders while in dorsal position
6 Raising head and shoulders with assistance
7 Reflecting friendly and angry facial expressions
8 Reacting negatively to the withdrawal of a toy
9 Expectation
10 Defence reaction to the withdrawal of a toy

Suggested Order of Presentation

1 2 4 3 7 5 6 8 9 10

Abbreviated Procedure

3 7 5 8

(*Each item counts 3 days*)

Description of Test Items

1 *Distinguishing between an object and its environment*[131]

A rattle (1) is held before S at a distance of about 25 cm

+ S looks first at the rattle, then at its environment, and clearly distinguishes one from the other

Looking away from the object because S is no longer interested in it should be carefully distinguished from the behaviour called for in this item In the former, S looks away from the object which he has observed for some time and begins to look around the room In this test, however, S looks for a moment at the environment and then continues to observe the object.

2 *Distinguishing between the bottle and a rubber doll**

A bottle, which should be the same size, shape, and colour as the bottle used for feeding (15) is brought into the

child's line of vision for 30 seconds After an interval of 30 seconds S is shown a rubber doll (19) in the same position.

+ The child reacts differently. The usual reactions to the bottle include opening the mouth, sucking movements, turning the head to the side, etc., while such behaviour as occurs in the feeding situation does not occur in connection with the doll

3. *Grasping an object in view with one hand**

The rattle (2) is held within grasping distance of S

+ S grasps the object with one hand, clutching it with his fingers This item is also passed if S grasps with both hands, provided his fingers are used.

4 *Removing the cloth while in dorsal position*[*48]*

The cloth (14) is put over the child's face so that it covers it completely

+ S extricates himself by pulling the cloth away with his hands.

5. *Raising head and shoulders while in dorsal position**

The bell (22) is moved towards the child's face from the foot of the crib until it is within his field of vision It is then moved back towards the foot of the bed If S has been playing with a toy this may be taken away from him and moved towards the foot of the crib as an equivalent test

+ S raises the head from the under-surface, frequently both head and shoulders This reaction can often be observed during the intermission between two test items.

6. *Raising the head and shoulders with assistance*

E pulls the child, who is in dorsal position, up to a sitting position by his hands.

+ S raises head and shoulders and attempts to get up (Fig. 3).

7 *Reflecting friendly and angry facial expressions**[121]

E bends over the child until his face is about 25 cm from that of the child, smiles and talks in a friendly tone of voice for 30 seconds He suddenly changes his tone of voice, frowns, and talks angrily for 30 seconds

+ S reacts to this change by frowning and showing signs of negative expressive movements These may again change back to normal after a few moments Smiling and positive expressive movements are often noticeable in response to the friendly attitude of E (Figs 4 and 5)

8 *Reacting negatively to the withdrawal of a toy**

A toy which S has been manipulating is suddenly taken away from him

+ Expressions of displeasure, negative expressive movements

9 *Expectation*[131]

E makes snapping movements with the fingers before the child's eyes A snapper (6) may be used, hidden in the hand, but the fingers should still be moved before the child's eyes. After the child's attention has been attracted to the regularly repeated noise E discontinues it and keeps his hand quiet

+ The child continues to look intently at the hand, or stretches his arms, and attempts to grasp it, or utters a sound

10 *Defence reactions to the withdrawal of a toy**[48, 44]

S is allowed for a few minutes to manipulate a toy which is then suddenly taken away from him.

+ S offers some sort of resistance to E as he attempts to take the toy away This often takes the form of firmly holding on to the object (Fig 6)

VII

THE SEVENTH MONTH

1 Grasping the table edge
2 Reaching in the direction of a light
3 Turning around while sitting with support
4 Removing the cloth while in prone position
5 Sitting with support
6 Turning from back to side
7 Actively seeking contact
8 Looking for a lost toy
9 Imitative beating on the table
10 Manipulating a stationary object with a moving one

Suggested Order of Presentation

2 6 7 5 4 10 8 1 9 3

Abbreviated Procedure

7 4 10 8

(*Each item counts 3 days*)

Description of Test Items

1. *Grasping the table edge*[94]

E sits at a table, preferably at its corner, and takes S on his lap so that S can reach the table with outstretched arms

+ S grasps the edge of the table and holds on to it

2 *Reaching in the direction of a light*[125]

The flashlight (18) is held at a distance of 50 cm from the child.

+ The child stretches his arms towards the light in an attempt to grasp it When the light is brought closer he will often actually do so.

3 *Turning around while sitting with support*

E takes the child on his arm and supports his back lightly The red wool (16) has been suspended somewhere in the room at the level of the child's eyes E carries the child towards the wool and turns away from it as soon as S pays attention to it This is done in such a way that S can only see the wool by turning his head

+ S turns his head to look at the wool

4 *Removing the cloth while in prone position*[*48]

S is placed on his stomach with a cloth (14) over his head, which is made to close in over his face by drawing the corners of the front part back over his shoulders

+ S remains in the prone position and extricates himself with his hands (Fig 7)

5 *Sitting with support*

A blanket is hung over the side of the bed and S placed in a sitting position leaning against it (not in a corner of the crib)

+ The child remains in this position

6 *Turning from back to side*[*46, 44]

A bell (12) is rung beside the child, who is in dorsal position, or a rattle (1) is brought within grasping distance so that it can be obtained by a slight turn sideways

+ The entire body turns This item is passed when the pelvis is turned The reaction often takes place without special preparation in the course of the testing procedure.

7 *Actively seeking contact*[*43]

E, standing beside the child's crib, pays no attention to S and avoids looking at his face

+ S attempts to make contact by cooing, etc. (Fig. 8)

FIG. 7.—Removing the cloth while in prone position (VII, 4)

FIG. 8.—Actively seeking contact (VII, 7)

Fig. 10. Reaching for an object outside the crib (VIII, 1)

Fig. 11.—Pushing away a disagreeable stimulus (VIII, 3)

8 *Looking for a lost toy*[*131]

The child's behaviour is observed when a toy is accidentally lost or is taken away from him without using force

+ S turns his head in the direction where the toy disappeared and looks about searchingly.

9 *Imitative beating on the table*

E sits at a table with S on his lap and beats on the table with the hand while the child looks on. It is sometimes necessary to continue this for five minutes.

+ S first follows the movements of the experimenter's hand with the eyes and then begins to beat on the table with his own hand or to make movements in the air It also occurs that S does not begin to imitate until after E has ceased beating (Fig 9)

10 *Manipulating a stationary object with a moving one*[*48, 44]

S is placed near the side of the crib or the wall He is given a rattle (I) to play with If the desired reaction does not occur a cardboard (II) may be held out for him to beat on

+ S beats with the object he holds in his hand on the stationary object (side of the bed, wall, or cardboard).

VIII

THE EIGHTH MONTH

1 Reaching for an object outside the crib
2 Removing the cloth while sitting with support
3 Pushing away a disagreeable stimulus
4 Remaining in sitting position
5 Locomotion
6 Taking a toy away from the adult
7 Playing peek-a-boo
8 Taking an object from the adult's pocket
9 Manipulating two toys
10 Changing position to reach an object

Suggested Order of Presentation

4 2 10 1 8 3 9 6 7 5

Abbreviated Procedure

1 9 7 5

(*Each item counts 3 days*)

Description of Test Items

1 *Reaching for an object outside the crib**

A toy is placed within the child's reach on a chair which has the same height as the bed or it is held at that level S has been placed near the railing of the crib

+ S stretches his arms through the railing and touches the toy It is not necessary for him to pull the toy into the bed with him (Fig 10)

2 *Removing the cloth while sitting with support**[48]

S is placed in a corner of the crib, supported by a pillow behind his back A cloth (14) is placed over his head as in VII, 4

+ S extricates himself without rolling over

FIG. 12.—Remaining in the sitting position (VIII, 4)

FIG. 13.—Taking an object from the adult's pocket (VIII, 5)

FIG. 14.—Removing the cloth while sitting without support (IX, 2)

FIG. 15

FIG. 16

Imitative drumming with one stick (IX, 8)

3 *Pushing away a disagreeable stimulus**[46, 44]

E goes through the movements of cleaning the child's nose with a piece of cotton wool (13)

+ S grasps the experimenter's hand and pushes it away from his face (Fig 11).

4 *Remaining in the sitting position*

S is placed in the sitting position near the railing of the crib.

E supports the child's back and withdraws his hand when the child holds on to the railing, though remaining in readiness to grasp him if he should topple over It sometimes happens that S supports himself with his hands stretched on the mattress

+ S is able to remain in the sitting position by holding on to the railing or supporting himself on the mattress (Fig 12)

5 *Locomotion**

This reaction cannot be stimulated experimentally, but it is certain to occur during the testing procedure if S is capable of performing it

+ S moves from the spot in one fashion or another, regardless of whether this is sideways or forwards, by turning from his back to his side and then on to his stomach, or by some other movements He should not crawl but roll over and push himself forward.

6[3] *Taking a toy away from the adult**[43]

E places his hand in which he holds a rattle (1) within grasping distance of S in his crib

+ S attempts to take the toy away from E with some display of force

7. *Playing peek-a-boo**

E stands at a distance of about 40 cm from S and covers the child's face with a cloth (14) After 10 seconds the cloth is

removed and put back after another 10 seconds This is repeated and each time when the cloth is placed over the child's face the experimenter says "peek-a-boo," when it is lifted up "da da."

+ S looks with interest in the direction where the experimenter's face appears and greets its appearance with a smile.

8 *Taking an object from the adult's pocket**

S is placed in a sitting position in bed, if necessary with support A toy is placed in the experimenter's pocket while the child is looking and brought close enough for S to grasp Part of the object should remain visible from the pocket

+ S takes the toy from the pocket (Fig 13)

9 *Manipulating two toys**[16, 44]

While S is playing with one rattle (2) a second rattle (1) is handed him

+ S takes the second rattle without dropping the first and moves both rattles about.

10 *Changing position to reach an object*

A rattle (1) or another object in which the child shows interest is put in such a place that he can see but not reach it without changing his position It may be placed on the pillow beside him or held in his line of sight so that, for instance, he can only reach it by supporting himself on one arm and by pushing himself towards it

+ S actually makes an attempt to move towards the object

IX

THE NINTH AND TENTH MONTHS

1 Grasping two objects when sitting without support
2 Removing the cloth when sitting without support
3 Sitting without support
4 Crawling
5 Responding specifically to gestures
6 Attracting the adult's attention
7 Uncovering a hidden toy
8 Imitative drumming with one stick
9 Beating two spoons together
10 Grasping the same object twice

Suggested Order of Presentation

3 4 1 7 8 6 5 9 10 2

Abbreviated Procedure

3 7 6 9 10

(*Each item counts 6 days*)

Description of Test Items

1 *Grasping two objects when sitting without support**

To the child who is sitting up without support of any sort the rattle (2) is handed and shortly afterwards the rubber doll (19)

+ S grasps the second object without dropping the first and without seeking support.

2 *Removing the cloth when sitting without support**[48]

A cloth (14) is placed over the head of the child who sits up without support.

+ The child extricates himself without toppling over (Fig. 14).

3. *Sitting without support**

The child is seated in the middle of the crib without support of any kind.

+ S is able to hold this position

4. *Crawling**

S is brought to the prone position and a favourite toy placed before him out of reach This response often occurs spontaneously during the testing procedure.

+ S moves forward by crawling If he only rolls over sideways the item is not passed.

5. *Responding specifically to gestures**[121]

E places himself before the child and stretches his arms out to him invitingly while encouraging him by hand movements After a short interval E shakes his finger threateningly when the child looks at him and repeats this movement several times The facial expression should remain the same and as blank as possible.

+ Positive reactions, positive expressive movement and smiling, perhaps bending over towards E as responses to the inviting gestures; negative reactions, negative expressive movements and crawling away as responses to the threatening gestures.

6 *Attracting the adult's attention**

E, standing beside the child, turns his back to him and seems occupied with other things

+ S attempts to attract his attention by pulling his coat or reaching out a toy.

7. *Uncovering a hidden toy**

A toy is covered with a cloth (14) folded twice in the middle while the child is watching

+ S uncovers the toy and grasps it.

FIG 17

FIG 18

Grasping the same object twice (IX, 10)

FIG 19.—Pulling an object within reach with a string (X, 8)

FIG. 20

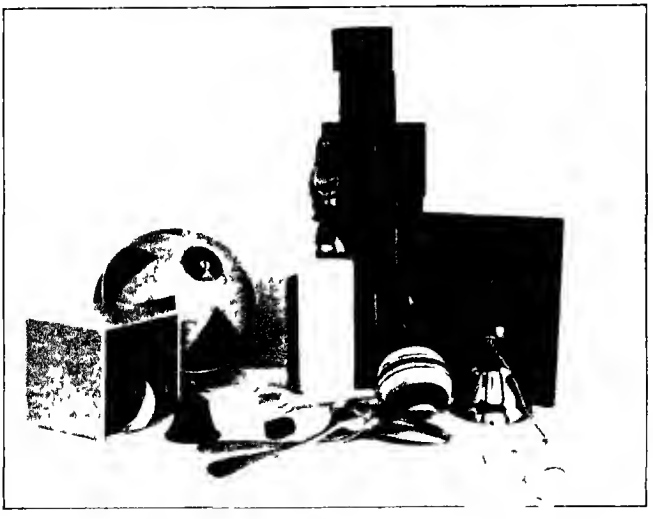


FIG. 21

Materials required for the First Year Series

8 *Imitative drumming with one stick*[109]

E beats on the drum (18) with one stick and hands S the stick.

+ S imitates the movements with the stick. This item is passed when the movement is made in the air without actually touching the drum (Figs. 15 and 16).

9 *Beating two spoons together**[109]

S sits up in bed, E stands behind him and leans over, beating two spoons (7) together before the child's eyes. He then gives the spoons to S

+ S rubs the spoons together in some fashion. The item is passed even when the child does not succeed in actually bringing the spoons together but moves them towards each other with strained attention.

10 *Grasping the same object twice**[45]

E holds out two objects, such as the rattle (1) and the rubber doll (19), one in each hand, within grasping distance of S and about 25 cm apart E waits until S grasps one of them After taking this object away from S, E holds them out again, this time interchanging their position

+ S looks at both objects before turning to either one of them, and grasps the same object that was selected the first time (Figs 17 and 18)

X

THE ELEVENTH AND TWELFTH MONTHS

1 Rising to the sitting position without assistance
2 Coming to the standing position with support
3 Turning to the adult in surprise
4 Remembering the contents of a box after one minute
5 Imitative ringing of the bell
6 Holding two cubes together attentively
7 Opening a box
8 Pulling an object within reach with a string
9 Investigating the mechanism of the bell
10 Obtaining an object from behind a screen

Suggested Order of Presentation

9 8 7 10 1 2 4 5 6 3

Abbreviated Procedure

8 2 4 5 3

(*Each item counts 6 days*)

Description of Test Items

1. *Rising to the sitting position without assistance**

E holds an object far enough from S so that he cannot reach it without raising himself.

+ S comes to the sitting position This response often occurs spontaneously in the course of the testing procedure

2. *Coming to the standing position with support*

S, who is in the dorsal or sitting position, is forced to get up with the aid of the railing of the crib by E, who holds a toy higher every time the child attempts to grasp it

+ S comes to the standing position while holding on to the side of the bed. This response often occurs spontaneously.

3. *Turning to the adult in surprise (beginning of questioning)**

E unexpectedly blows a whistle (5) or flashes a light (18) near the child

+ S turns to E and looks surprised

4 *Remembering the contents of a box after one minute**[131]

S is handed a box in which a ball (21) or a bell (23) has been placed and is allowed to play with it for one minute. Each time the child takes the object out, E replaces it After one minute the box is taken away from S, the object removed, and the empty box returned to him after a period of one minute.

+ S misses the toy, looks into the box with surprise, perhaps feels around in the box or looks at E with surprise.

5 *Imitative ringing of the bell**[109]

E swings the bell (22) before the child and gives it to him. The demonstration should be repeated several times.

+ Any attempt on the part of S to imitate the movement counts positively This test is best given in combination with item 9

6. *Holding two cubes together attentively*[123]

The cubes (24) are placed before S with the openings up

+ S may hold two cubes together, observe the movements he makes with one of them, or he may manipulate the material carefully. It sometimes occurs that a child of this age will place a small cube inside a larger one.

7. *Opening a box**

The box (26) is closed and placed before the child.

+ S attempts to open the box

8 *Pulling an object within reach with a string**[49]

A bell (22) or a rattle (2) is tied to a thin, colourless string

and placed out of the child's reach, preferably on a chair beside the bed. The other end of the string is placed before the child, if necessary very close to his hands

+ S pulls the string to get the object. The item is also passed when the child does not quite succeed in pulling the object within reach (Fig. 19).

9 *Investigating the mechanism of the bell*

E swings the bell (22) before S and gives it to him.

+ S turns the bell around, looks inside, grasps the clapper, or occupies himself in some other manner with the inside of the bell This test is best given in combination with item 5.

10 *Obtaining an object from behind a screen*

A favourite toy, such as the bell (22) or a ball (20), is placed before the child As soon as he reaches for it E places the screen (12) between the child and the toy If S does not reach round it E can show the toy on the side of the screen and then hide it again

+ Usually after some unsuccessful attempts to reach through the screen, S looks or reaches behind it

MATERIALS REQUIRED FOR THE FIRST-YEAR TESTS

(See Figures 20 and 21)

1 A rattle made of celluloid, white on one side, red on the other, 18 cm long, diameter of ball 8 cm

2 A rattle with multi-coloured stripes, having a ring at the end of the handle

3 A toy-clacker with three tongues of unpainted wood which makes an even noise of small volume

4 A ruler made of soft wood, 50 cm long and 5 cm wide, and a round stick of soft wood 25 cm long with a diameter of 1 cm.

5 A whistle tuned to A

6 A snapper. We used a small tin frog 2½ cm long and 1 cm wide, which gave a snapping sound when pressed

FIG. 22.—Rubbing two sticks together (XI, 1)

FIG. 23.—Organized ball play (XI, 4)

FIG. 24.—Taking a nest of cubes apart (XI, 9)

FIG. 25.—Playing with a watch (XIII, 2)

FIG. 26

FIG. 27

Placing two hollow sticks together (XIII 6)

FIG. 28.—Placing two hollow sticks together (XIII, 6)

FIG. 29.—Building a tower (XIII, 7)

7 Two aluminium tablespoons 22 cm long

8 A tin drum with a diameter of 16 cm and 8 cm high, with a stick of soft wood, 16 cm long with a diameter of 1 cm, slightly rounded at one end

9 A thin piece of white cardboard (16 cm by 23 cm) folded so that the two shorter sides come together

10 A strong piece of cardboard (16 cm by 23 cm) covered on both sides with dull white paper

11 A strong piece of cardboard (16 cm by 23 cm.) covered on both sides with dull red paper

12 A grey cardboard (24 cm by 38 cm) several millimetres thick so that it cannot be bent

13 A piece of cotton wool or gauze

14 A closely woven cloth, 50 cm by 50 cm.

15 A feeding bottle filled with a white, non-odorous fluid, closed with a cork hidden by a nipple This bottle should be similar in every respect (shape, size, colour, amount of fluid) to the one normally used in feeding the child

16 A skein of red wool, 50 grm in weight

17 A brown rabbit-faced mask, 30 cm high and 17 cm. wide.

18 A 2 5-volt flashlight

19 A doll of red-brown rubber, 14 cm high

20 A rubber ball with red and yellow stripes, diameter 12 cm, weight 100 grm

21 A celluloid ball, blue on one side, white on the other, diameter 4½ cm

22 A table bell with a diameter of 7 cm and a total height of 13 cm to which a string 80 cm long is attached

23 A small metal bell, 3 cm high, with a wooden handle 2 cm long.

24 Hollow cubes made of thin wood The five sides of the six cubes measure 4, 5, 6, 7, 8, and 9 cm in length and width, painted red and glazed on the outside

25 A box without lid (or a hollow cube), measuring 6 cm in all directions, made of thin wood and covered with blue glossy paper.

26 A white cardboard box (9 cm by 7 cm. by 5 cm) with a loosely fitting lid (9 3 cm by 7 3 cm by 1 5 cm).

27. A stopwatch.

CHAPTER II

THE TESTS FOR THE SECOND YEAR OF LIFE

BY

IRMGARD GINDL AND LUDWIG KOLLER

XI

THE FIRST THREE MONTHS

1. Rubbing or beating two sticks together
2. Standing without support
3 Holding an object while walking with support
4. Organized ball play
5 Understanding simple commands
6. Remembering the contents of a box after three minutes
7. Looking for the chick after three minutes
8 Squeezing the ball with the chick
9 Taking a nest of cubes apart and putting it together again
10 Reaching for a rusk in the mirror.

Suggested Order of Presentation

8 7 10 5 6 2 3 1 9 4

Abbreviated Procedure

7 5 2 9

(*Each item counts 9 days*)

Description of Test Items

1. *Rubbing or beating two sticks together* [152]

S is given two sticks (2) to play with and his behaviour noted for five minutes.

+ S rubs the sticks together or beats one on the other while listening to the noise (Fig 22).

2. *Standing without support*

If S has not already demonstrated his ability to stand without support for a moment, he is asked to stand up or is placed on his feet while support is withdrawn when it is found that he can handle the situation

+ S stands without support for a moment.

3. *Holding an object while walking with support*

E calls the child over when he has a toy in his hand S should have the opportunity of holding on to a chair or to the side of the bed

+ S walks with support without dropping the toy.

4. *Organized ball play*

S is placed in a corner of the crib. A ball (5) is rolled towards him and away from him.

+ S rolls the ball back to E This should be repeated a number of times (Fig. 23)

5 *Understanding simple commands*

E tells S in the course of the testing procedure to "get up," "lie down," "come here," "give that to me," without making explanatory movements.

+ S obeys two of these commands.

6. *Remembering the contents of a box after 3 minutes*[131]

The cube (6) is put before the child with the opening downward. It is left in this position 30 seconds If S picks it up it should be taken away from him and returned to the same position. After 30 seconds the cube is turned over so that the opening is turned up. The objects (8) are slowly put into the cube and the child given a chance to observe this closely. His attention should be as intense as possible The cube is then given to him to play with for one minute during which he may take the objects out and replace them, shake the cube so that it rattles, etc. After 60 seconds it is taken away from the child and hidden for three minutes. During this latent period he may be given something else to do. After three minutes the cube is again placed in front of him with the opening turned down, but the objects have been removed.

+ S immediately picks up the cube, turns it over, and looks

inside or shake it, showing surprise at not finding the objects, or looking at the experimenter quizzingly.

7. *Looking for the chick after 3 minutes*[131]

S is given the ball with the chick (9) and is shown that the chick comes out when the ball is squeezed and that it remains out as long as pressure on the ball continues. This demonstration lasts 1 minute, after which the ball is taken away and S is occupied with something else for 3 minutes He is then handed the ball without the chick.

+ S shows clearly his surprise at the absence of the chick. He squeezes the ball and looks questioningly at E or around him and sticks his finger into the hole If S has been afraid of the chick when it suddenly appeared it may be noted from the absence of signs of displeasure or fear that he now misses the chick

8. *Squeezing the ball with the chick*

E gives the ball (9) to S and attempts for 1 minute to teach him how to squeeze the ball so that the chick appears.

+ S can make the chick appear without help.

9. *Taking a nest of cubes apart and putting it together again*[123]

S is handed a nest of cubes (1) and his play observed for 5 minutes.

+ S takes at least one cube out or drops it and replaces it. This should be done without demonstration of any manipulation by E (Fig. 24).

10 *Reaching for a rusk in the mirror*

A mirror (7) is held before S at about 15 cm distance and a rusk (4) beside his head so that it is visible to S in the mirror. E should make sure that the image of the rusk can be seen

by S and should prevent S from discovering the real position of it by touching the hand that holds it.

+ S reaches in the mirror in his attempt to grasp the rusk. It is enough when this is done once since many children realize after their first attempt that this is not the proper way to go about it.

XII

THE SECOND THREE MONTHS

1 Observing a moving object
2 Walking
3 Carrying an object while walking with support
4 Turning to the adult for explanation
5 Understanding a prohibition
6 and 7 Remembering the chick and the contents of a box after eight minutes
8 Imitative beating with two drum-sticks
9 Preferring coloured figures to plain colours
10 Finding a rusk under one of two cubes

Suggested Order of Presentation

7 1 9 5 6 8 4 3 2 10

Abbreviated Procedure

7 5 2 10

(*Each item counts 9 days*)

Description of Test Items

1 *Observing a moving object*

The top (4) is spun on a chair beside the bed.

+ S looks on attentively or shows surprise.

2. *Walking*

S is put on his feet in bed or on the floor and is called towards E who holds out a rusk or a toy.

+ S walks towards E without seeking support in any way.

3 *Carrying an object while walking with support*

S is placed on his feet and is given an object to hold. Then E takes the child's hands and leads him two or three yards.

+ The child walks with help without dropping the objects.

4. *Turning to the adult for explanation*

S is set up in bed and given the mirror (7) to hold.

+ S perceives his image, looks around searchingly, and turns the eyes questioningly or in surprise to E.

5 *Understanding a prohibition*[163]

E gives the child some toys and plays with him for five or ten minutes A toy is now placed in reaching distance of S and manipulated quite noticeably by E whenever S looks at it S is prevented from touching it and the admonition "Don't touch that! You can't have that!" is repeated as long as S continues to reach for the forbidden toy.

+ S understands the command, does not actually grasp the toy, but withdraws his hands as soon as E tells him to keep away from the toy or shows in other ways that the command has been understood.

6 *and* 7 *Remembering the chick and the contents of the box after 8 minutes*[131]

Same procedure as in Series XI, 6 and 7, except that now the latent periods are 8 minutes each

8 *Imitative beating with two drum-sticks*[109]

The drum with two sticks (3) is placed in the crib. If S does not begin drumming with both sticks spontaneously within 1 minute, E shows him how and hands him the sticks.

+ S drums with both sticks.

9. *Preferring coloured figures to plain colours*[130]

S is given a cardboard covered with a plain coloured paper (10) After 1 minute, or sooner if his interest seems to wane,

this is replaced by one on which coloured figures have been pasted (11).

+ S shows more interest for the figures and occupies himself with them more intently, feeling round the figures, etc, while the first cardboard was merely manipulated

10. *Finding a rusk under one of two cubes*

Before the child, who is sitting up in bed, a red (1) and a blue cube (6) of the same size are placed with the opening turned down, far enough apart so that S cannot grasp them both at the same time. A rusk is placed before his eyes under one of the cubes and their position is then changed by pushing the one on the right over to the left and vice versa.

+ S reaches for the cube which hides the rusk and lifts it up This test should be repeated at least three times to avoid accidental solutions The rusk should, of course, not be placed under the same cube each time Two out of three findings should be correct

XIII

THE SECOND HALF-YEAR

1 Climbing on a chair
2. Social play with a watch
3 Naming objects
4 and 5 Remembering the chick and the contents of the box after 17 minutes
6 Placing two hollow sticks one into the other
7. Building a tower
8 Contemplating a finished structure made by grown-up
9. Pulling an object within reach with a stick
10. Recognizing a picture

Suggested Order of Presentation

4 2 3 10 5 9 6 1 8 7

Abbreviated Procedure

10 5 6 7

(*Each item counts 18 days*)

Description of Test Items

1. *Climbing on a chair*

S is placed before a chair (15) and a rusk held over the back of the chair.

+ S climbs upon the chair and stands on it

2. *Social play with a watch*

E holds a watch (13) to the child's right ear, slowly saying "tick-tock"; then E brings it to his own left ear. S is given the watch with the words "where is tick-tock?" and, while E points to his own ear, "show me tick-tock!"

+ S reacts to the question by holding the watch to his own ear and to the command by holding it to the ear of the experimenter (Fig. 25).

3. *Naming objects*

If S has not named an object spontaneously during the testing procedure or has asked for a desired object by name, E tries to make him do so by pointing out familiar objects (doll, ball, etc) asking "what is that?" or "what do you want?"

+ S names at least one object.

4 *and* 5. *Remembering the chick and the contents of the box after 17 minutes*[131]

Same set-up as in XI, 6 and 7, but with latent periods of 17 minutes each.

6 *Placing two hollow sticks one into the other*

Same situation as in XI, 1.

+ S puts one stick into the other, or at least attempts to do so by laying them end-to-end (Figs 26–28)

7. *Building a tower*[123]

S is given the cubes (1) to play with.

+ Within 5 minutes S builds a tower of at least two cubes (Fig 29).

8. *Contemplating a finished structure made by grown-up*[123]

E builds a tower with the cubes

+ S contemplates the tower attentively when it is finished.

9 *Pulling an object within reach with a stick*

One of the drum-sticks is placed in the crib and the child allowed to play with it. The top (4) is spun on a chair beside the bed If S is in his play-pen, the top should be spun outside on the floor. S should be unable to reach it with outstretched arm

+ S attempts to reach the top with his hand, then attempts to do so with the drum-stick (Fig. 30)

10. *Recognizing a picture*[130]

S is given the meaningless picture (12), which he will probably look at from all angles and put aside or use it to manipulate. After 1 minute the picture of the nurse (12) is given him.

+ S recognizes the picture and treats it differently from the other He points to it or looks smilingly at the experimenter. Children who talk call the picture "mamma," "dolly," "nursy," etc At E's request to show "mamma" or "dolly," S shows the picture of the nurse This should be tested with several names, but a reaction to any of the names suffices

FIG 30 —Pulling an object within reach with a stick (XIII, 9)

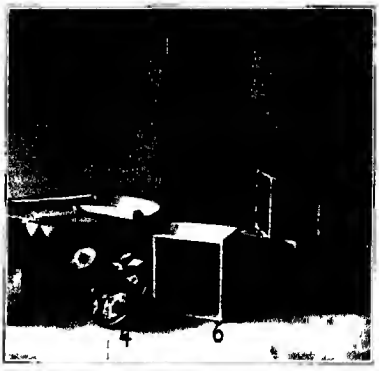


FIG 31 —Materials required for the Second Year Series

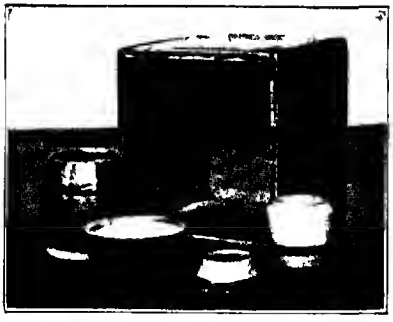


FIG 33

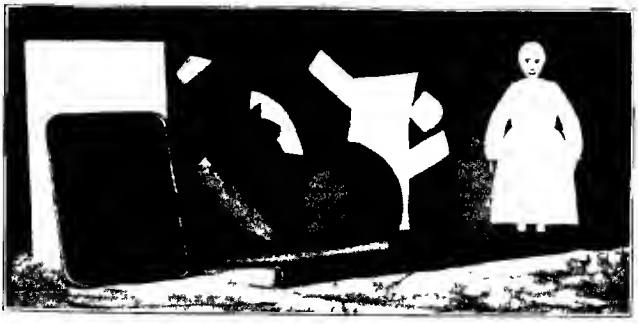


FIG 32

FIGS 32 and 33 —Materials required for the Second Year Series

FIG. 34.—Materials required for the Second Year Series

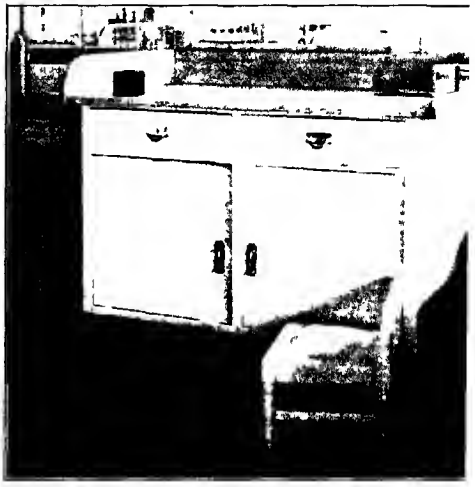


FIG. 35.—Arrangement for XIV, 9 'Using a chair as a tool'

FIG. 36.—Sorting (XV, 3)

MATERIALS REQUIRED FOR THE SECOND-YEAR TESTS

(See Figures 31–34)

1. Hollow cubes made of thin wood The five sides of the six cubes measure 4, 5, 6, 7, 8, and 9 cm in length and width The cubes are painted red and glazed on the outside.

2 A hollow stick, 38 cm long with a diameter of 2 cm and a knot in the middle A second stick, 25 cm long, with a diameter of 1 cm

3 A tin drum with a diameter of 16 cm and 8 cm high, two sticks of soft wood, 16 cm long, with a diameter of 1 cm and slightly rounded at one end

4 A multi-coloured top made of tin with a diameter of 10 cm and a height of 7 cm which spins for about 90 seconds

5 A rubber ball, diameter 12 cm , weight 100 grm.

6 A box without lid (or hollow cube), measuring 6 cm in all directions, made of thin wood, covered with blue glossy paper

7 A hand mirror with metal frame, size 18 by 13 cm

8 A blue box (6) containing two small wooden barrels that may be opened One, measuring 5 cm in height, 3 cm in diameter, is green, the other, 3 cm high and 1 5 cm in diameter, is yellow (Fig 33)

9 A purple rubber ball, diameter 6 cm , with a red-encircled opening of 1 5 cm diameter A yellow chick, 4 cm high, appears when the ball is squeezed Two of these balls are required, from one the chick should be removed

10 A cardboard (16 by 23 cm) covered with glossy red paper

11 A piece of cardboard (16 by 23 cm) covered with glossy red paper Different coloured paper figures are pasted on this background

12. On a grey-coloured piece of cardboard (16 by 23 cm) the picture of a woman is pasted On a second piece of the same size the various parts of this figure are grouped in a meaningless way

13 A stopwatch

14 Small rusks

15. A chair.

CHAPTER III

THE TESTS FOR THE THIRD TO FIFTH YEARS OF LIFE

BY
MARIA MAUDRY

XIV

THE THIRD YEAR

1 Buttoning
2 Social element in fiction play
3 Resuming an activity on demand
4 Talking about absent things
5 Finding two out of three hidden objects
6 Repeating four syllables (two words)
7 Imitative building
8 Spontaneous building
9 Using a chair as a means to get an object
10 The formboard

Suggested Order of Presentation

8 7 10 3 5 6 4 1 9 2

Abbreviated Procedure

5 4 9 2

(*Each item counts 36 days*)

Description of Test Items

1. *Buttoning*

E puts the jacket on the teddy-bear (1) and asks S to button the coat

+ S buttons the coat.

2. *Social element in fiction play*

S is given the teddy-bear, an empty box, and a cloth (1).

After a while E gives him a small bottle made of plasticine with the words "here is a bottle for you."

+ S uses the objects for social play. he puts the bear to sleep, feeds him, etc.[120]

3. *Resuming an activity on demand*[347]

E empties a box with 100 red and 100 yellow slips of paper (4) before S, places on the child's left and right two tops of boxes and shows S how to sort the papers, saying: "all the red ones go here, the yellow ones there "

+ S understands the principle and can be persuaded to continue the sorting activity at least three times after he has lost interest.

4. *Talking about absent things*[45]

E attempts in the course of the testing procedure to get the child to talk in terms of ideas There are three possibilities·

a. Spontaneous narrative.

b Answering questions such as "What did Santa Claus bring you?" "What does mamma do in the kitchen?"

c. Asking for an object in which the child has shown particular interest earlier in the test

+ Any clear verbal expression of ideas.

5. *Finding two out of three hidden objects*

While S looks on, E puts the doll, ball, and brush in drawers 3, 6, and 15 of the store (5) and shows them again by pulling out the drawers in the same order. Finally he asks S to show him the objects If S cannot find them the first time, E may show them again. This procedure may be repeated three or four times if necessary The store is then set aside for 20 minutes, after which S is asked to get the hidden objects

+ S looks for two of the three objects in the right drawers without errors

6. *Repeating four syllables (two words)*

While showing the pictures on Table I (8), E slowly speaks four syllables and points to the corresponding picture, asking the child to repeat them If this is not done at the first attempt

FIG 37 —Naming a structure ('House') (XV 8)

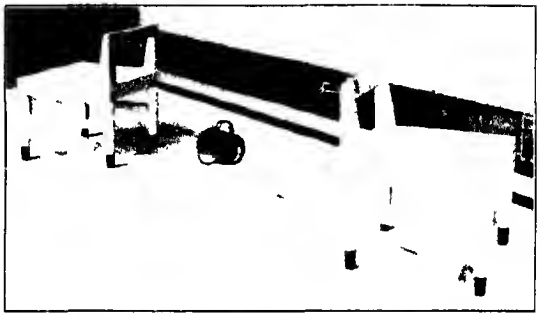


FIG 38 Arrangement for XV 9 Taking a ring from a hook to get an object

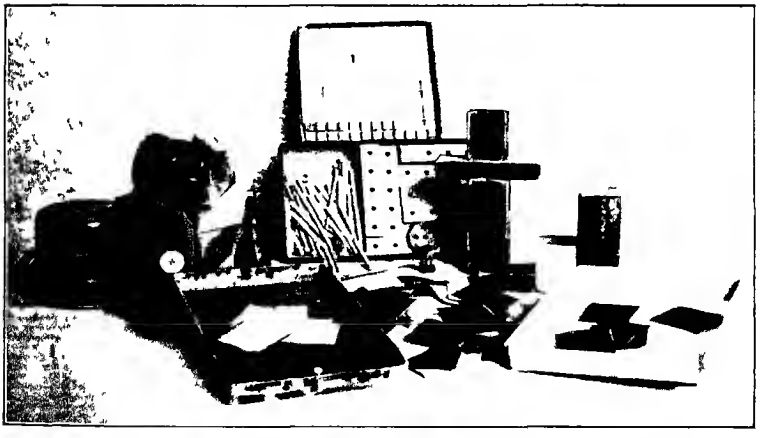


FIG 39 —Materials required for the Third to Fifth Year Series

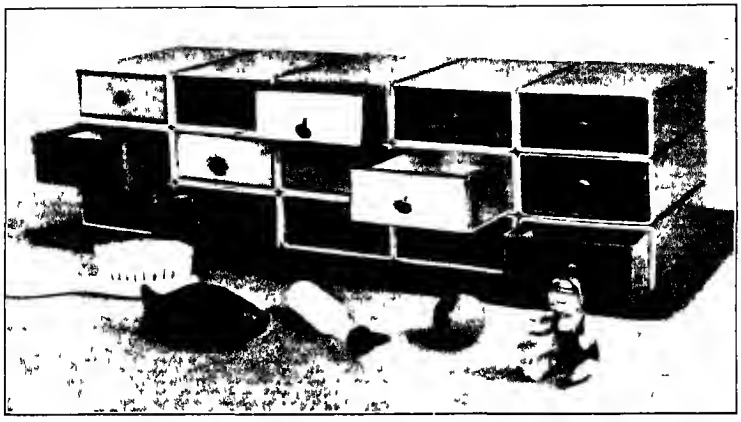


Fig. 40

Fig. 41

Materials required for the Third to Fifth Year Series

the procedure for the first picture may be repeated once or twice. In that case, however, the results for that picture do not count and E proceeds to the next. The syllables are:

a little dolly
b hurry, kitty
c Boy says "toot-toot"

+ S speaks at least one of the three phrases after hearing it once.

7 *Imitative building*

E builds a cross with the three blocks (3, Fig 39) and destroys it after S has seen it and has been asked if he can do that too. S is then told to build it again and is given the three blocks. This same procedure is repeated for building a staircase (Fig 39)

+ S imitates correctly at least one of the structures.

8. *Spontaneous building*[123]

E gives the child the blocks (3) to play with for 5 minutes.

+ S puts some of the blocks together, erecting a two-dimensional structure

9 *Using a chair as a means to get an object*

A rusk is placed on the dresser so that the child can see it but cannot reach it without the aid of a chair placed 2 feet from the dresser He is asked to get the rusk (Fig 35).

+ S pulls the chair up, climbs upon it, and gets the rusk.

10 *The formboard*[94]

The formboard (2) is emptied while S looks on; it is then given to him to play with for 3 minutes If the child has not already done so spontaneously, E replaces the figures and takes them out again, refraining from making any remarks.

+ S replaces the figures in the proper places

XV

THE FOURTH YEAR

1 Carrying a cup of water
2. Moral judgment
3. Sorting
4 Verbal formulation of plans
5 Finding 3 out of 4 hidden objects
6 Repeating a verse of 8 syllables (3 figures)
7 Drawing a circle in imitation
8 Naming a structure
9 Taking a ring from a hook to get an object
10 Interpreting a picture

Suggested Order of Presentation

8 7 5 3 10 2 6 4 9 1

Abbreviated Procedure

8 3 2 6

(*Each item counts 36 days*)

Description of Test Items

1. *Carrying a cup of water*

E gives the child a cup (6) which has been filled to 1 cm. from the brim and asks him to carry it about five metres, then turn around and come back with it.

+ S does not spill any water on the way.

2. *Moral judgment*

E shows the pictures IV to VII (8, Fig. 42) and makes sure by questioning that the child understand them, if this does not follow from spontaneous remarks. E then asks whether the child in the picture is "good" or "bad" and "why?" regardless of whether the answer to the first question is correct.

+ S gives at least two judgments which are counted correct

FIG. 42.—Materials required for the Third to Fifth Year Series

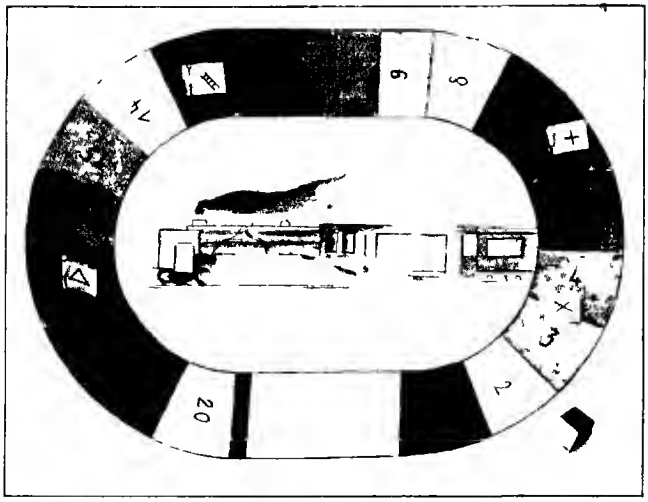


FIG. 44.—Materials required for the Sixth Year Series

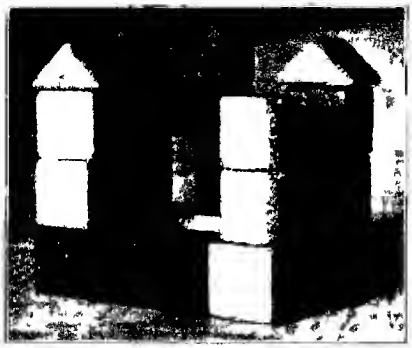


FIG 45 —Materials required for the Sixth Year Series

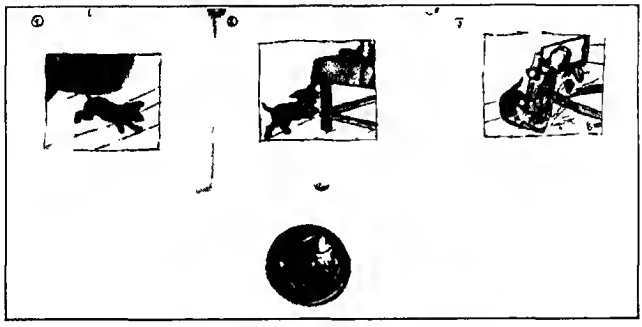


FIG 46 —Materials required for the Sixth Year Series

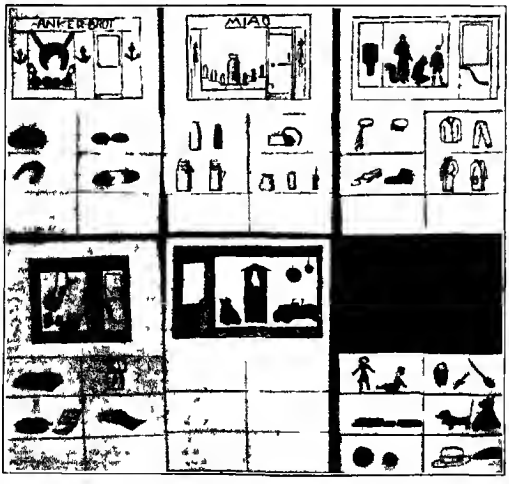


FIG 49 —Merchandise and shops (XVII, 10)

even if they are objectively incorrect when the reasons advanced in response to the "why" question are valid.

3. *Sorting*[349]

E gives the child the unsorted slips of paper as in XIV, 3, and tells S to sort them all.

+ S sorts all the slips without further urging or encouragement (Fig. 36).

4 *Verbal formulation of plans*[13]

E asks the child the following questions:

"What do you do when you are hungry?"
"What do you do when you are sleepy?"
"What would you do if I gave you a penny?"

+ S answers at least one of the three questions sensibly.

5 *Finding three out of four hidden objects*

Same procedure as in XIV, 5, except that four objects, doll, ball, brush, and fish, are placed in drawers 3, 6, 9, and 15.

+ After 20 minutes the child looks in the proper drawers without errors for at least three objects.

6. *Repeating a verse of 8 syllables (3 figures)*[94]

Same procedure as in XIV, 6 The first two verses may be said in connection with picture III (8) They are

a Under the tree sits wee Marie
b. Bettie climbs up right to the top
c A good little boy won't break his toy

In case S cannot be made to repeat these verses, E asks him after a pause, which may be occupied with other items, to repeat three figures 3 1 2, 4 3 7, 8 6 9.

+ S repeats at least one verse or one series of figures after hearing it once.

7. *Drawing a circle in imitation*[94]

E gives S a piece of paper and a red pencil (9) to play with. After a few minutes E draws a circle and says: "I'll draw a ball for you. Now can you draw one too?"

+ S draws a circle, that is to say, he makes an attempt to imitate one. The line should meet or very nearly meet.

8. *Naming a structure*[123]

S is given the blocks (3) to play with for 5 minutes. In case S does not name his structure spontaneously, E asks "What is that?"

+ S gives the structure a name (Fig 37).

9. *Taking a ring from a hook to get an object*

Two S-hooks (7) are fastened to the backs of two little chairs. A string is fastened to them by means of two rings and the cup (6) hung on the string. S is asked to get the cup and E watches that the hooks are not taken off the chairs, that the chairs are not upset, and that the rings do not accidentally come off the hooks (Fig. 38)

+ S takes a ring off the hook to get the cup.

10. *Interpreting a picture*[13, 94, 313]

Simple activities as represented in pictures I and II (8) are shown the child and he is asked: "What are the children doing?" "What is that?" in case he does not volunteer such information.

+ At least two of the activities are named.

XVI

THE FIFTH YEAR

1 Understanding the rules of a game
2 Competition
3 Performing three tasks
4 Finding four out of five hidden objects
5 Repeating a verse of twelve syllables (four figures)
6 Drawing schematic pictures in imitation
7 Naming a drawing
8 The patience game
9 Using the handle of a hammer as a tool
10 Completing the puppet

Suggested Order of Presentation

9 10 7 6 8 4 1 2 5 3

Abbreviated Procedure

10 7 4 1 2

(*Each item counts 36 days*)

Description of Test Items

1. *Understanding the rules of a game*

E gives the child half of the blocks of the mosaic game (13) and tells him that they will each take turns at putting in a block. This is illustrated by saying: "One for you, one for me" a few times while they put some blocks in. After a while E does not move when his turn comes and waits for S to tell him This situation is repeated a few times If S does not follow the rules of the game the instruction may be repeated, but not more than once

+ S understands the rules and waits for E at least five times.

2. *Competition*

The blocks of the mosaic game (13) are taken out and equally divided between E and S E proposes that each will fill in a row and says. "Who will get done first, you or I?" This is repeated for several rows while E arranges it so that he and S alternate in finishing first To avoid misunderstanding, it is advisable to give S only twelve blocks at a time since he may otherwise think that he is required to fill in more than one row

+ S enters into the spirit of the game. He shows this in rapid movements, pleasure at winning, and reluctance to concede defeat

3 *Performing three tasks*[13, 94, 313, 349]

E arranges a chair five steps to the left of a table, which is five steps to the left of an open door, holds a key and a rusk in the hand and gives the following instructions. "Take this key, put it on that chair, then close the door, then come over here and get this rusk" During the last words he puts the rusk on the table and repeats. "I'll say that again. put the key on the chair, close the door, and get your rusk," while pointing in the corresponding direction each time. E then gives S the key and stands aside so as to be out of his way

+ S carries out these commands in the proper order.

4 *Finding four out of five hidden objects*

Same arrangement as in XIV, 5 In this case five objects, doll, ball, brush, fish, and bottle, are put in drawers 3, 6, 9, 11, and 15

+ After 20 minutes S looks in the proper drawers without errors for at least four objects

5 *Repeating a verse of twelve syllables (four figures)*

Same arrangement as in XIV, 6, but the verses are said without reference to pictures.

The verses:

a. I saw my brother Jake eat a whole birthday cake
b The fishing here is fine, I catch them with my line
c. The bird flies on the roof, the hunter's gun goes "poof"

The figures are: 6 8 3 2, 7 5 2 4, 5 3 1 6.

+ S repeats at least one verse or one series of figures after hearing it once

6 *Drawing schematic pictures in imitation*

E draws schematically a house, a tree, and a table (Fig 41) and asks the child to draw the same things S should have finished each drawing before E draws the next picture.

+ S draws at least two of the three pictures A certain objective similarity should be noticeable.

7 *Naming a drawing*[120]

S is given paper and a red pencil (9) to play with for 5 minutes. In case he starts scribbling, E asks him to "draw something pretty" He then asks what S has been drawing

+ S draws something and names it spontaneously or at the experimenter's request

8 *The patience game*[11]

S is given the patience game (10, Fig 43), it is explained in case S does not understand spontaneously that the mouse should be caught in the trap E may demonstrate

+ S succeeds at least once to catch the mouse Accidental results do not count.

9. *Using the handle of a hammer as a tool*

The Matador box (11) is given the child to play with. After a few minutes E puts one of the short sticks into one of the cubes so that it can only be removed with the handle of the

Matador hammer or with a second, longer stick. He then asks S to remove the stick.

+ S uses the handle of the hammer or the stick. Hammering only is considered a failure.

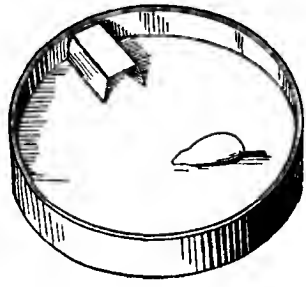


FIG 43—Patience game (one mouse)

10 *Completing the puppet*[238]

The parts of the puppet (12) are given the child to play with for 5 minutes

+ S joins the parts correctly Left and right arms and legs may be interchanged

MATERIALS REQUIRED FOR THE THIRD-, FOURTH-, AND FIFTH-YEAR TESTS

(See Figures 39–43)

1 A teddy-bear, 25 cm high, a cardboard box without lid, 12 by 15 by 8 cm , a cloth, 30 by 30 cm., a bottle made of plasticine; a sleeveless coat for the teddy-bear, having a buttonhole 2½ cm. long and a button 2 cm in diameter

2. A formboard From a piece of wood 0 5 cm thick, measuring 17 by 26 cm , four geometrical figures are cut out a triangle measuring 6 cm along each side, a half-circle 7 cm in diameter, a cross of two bars, each 3 cm wide and 6 cm long, and a rhombus 5½ cm wide and 4 cm high This piece of wood is glued on another piece which has not been cut out The figures should fit into the openings very easily

3 Nine blocks in different colours and shapes 2 rectangles, 10 by 4 by 4 cm , 2 rectangles 10 by 2 by 4 cm , one rectangle 5 by 4 by 4 cm , 2 rectangles 5 by 2 by 4 cm , and 2 half-circles, 10 by 4 by 4 cm

4 A box 20 by 14 by 8 cm containing 100 yellow and 100 red square pieces of paper, 4 cm. long and wide Two lids of equal size

5 Fifteen small pill-boxes, 6 by 8 5 by 2 5 cm in size, pasted together in three rows of five so that a frame with fifteen drawers is built The front of the "drawers" is covered with coloured paper and provided with a button. They are numbered from 1 to 15 horizontally, 1 to 5 forming the top row, 6 to 10 the middle, and 11 to 15 the bottom row The colours are as follows (1) bright green, (2) red, (3) white, (4) brown, (5) bright blue, (6) gold, (7) medium blue, (8) pink, (9) yellow, (10) black, (11) dark blue, (12) orange, (13) silver, (14) violet, (15) dark green The contents consist of a ball, a doll, a brush, a fish, and a bottle which fit into the drawers

6. An enamelled cup, 9 cm in diameter and 9 cm high, ½ litre capacity

7 A string, 70 cm. long, with a metal ring of 2 cm diameter on either side Two S-hooks are bent so that one end fits over the back of a chair while the other end is bent back to prevent accidental slipping of the rings (Fig 41).

8. Pictures, size 24 by 30 cm , with the following subjects.

I Doll, ball, running cat, running dog, boy with drum boy with horn.

II A child drinking from a bottle, a boy being bitten by two geese, a dog eating from a plate, a boy playing with a hoop has fallen and lost a shoe

III. An apple-tree with a ladder against it, a girl sits under the tree eating an apple, a second girl is climbing the ladder.

IV Two fighting girls, one pulling the other's hair

V Two girls looking at a picture book

VI One girl handing another an apple.

VII One girl refusing another an apple

9 A sheet of paper (20 by 16 cm) and a red pencil

10 A round box, 6 cm in diameter and 1 cm high, covered with glass, containing a stationary mouse-trap and a movable mouse which fits into the trap (Fig 43)

11 Matador box No 1, containing wooden cubes provided with holes, wooden pegs of various sizes and a wooden hammer

12 A puppet (after Pintner–Patterson) From a piece of wood, about 7 mm thick, the parts of a puppet have been cut in the following dimensions body, 11 6 by 6 7 cm at its widest place, legs, 13 2 cm long, arms 10 4 cm long, head, 4 2 cm long On one side of the figure the eyes, nose, mouth, hair, collar, coat, buttons, cuffs, and shoes are drawn with heavy lines.

13 A mosaic game The interior of a square box, 14 cm long, is subdivided into 12 by 12 squares by means of narrow strips of wood, 0 5 cm high Into these squares wooden blocks 0 8 cm high can be fitted These blocks are painted various bright colours

14 A key

15 Two chairs

16. Small rusks.

CHAPTER IV

THE TESTS FOR THE SIXTH YEAR OF LIFE

BY

LOTTE DANZINGER

XVII

THE SIXTH YEAR

1 Understanding the rules of a game and competition
2. Drawing a border
3 Repeating a verse of sixteen syllables
4 Building a complicated structure in imitation
5 Meaningful drawing
6 The patience game (two mice)
7 Taking off a hook to get an object
8 Understanding the causal relationship of three pictures
9 Noticing mistakes in a picture
10 Connecting merchandise and shops

Abbreviated Procedure

1 3 4 8 10

(*Each item counts 36 days*)

Description of the Test Items

1. *Understanding the rules of a game and competition*

E tells S that he wants to play a railway game (1) with him Each player gets a locomotive. The train which reaches the end of the line first wins the game. The signals are as follows: the flag with a triangle means "tunnel," a cross "wreck," a + sign "stop," and a ladder "line clear " This explanation is repeated once and the child asked to repeat it If after eight repetitions S has not learned the signals the game should be begun anyway. The flags are affixed to the board at the points indicated On reaching the "tunnel" the player must go back one square; "wreck" means two squares back; "stop" lose one turn; "line clear" means take two turns These rules are to be given the child when the occasion arises during the game, not in advance. The colour of the upturned side of the cube indicates the square of the corresponding colour to which the player moves.

Both engines are placed at the starting-point. The child throws the cube and names the colour of the upturned side. He is then told to move his engine until he gets to the first square of that colour. When E throws the cube he asks S to tell him where to go and repeats this procedure as often as is necessary If one of the engines gets to a square with a flag, the child is asked its meaning, and E indicates what is to be done. If towards the end the indicated colour does not appear in the remaining squares the cube is handed to the other player. After the game is over the child is asked who has won.

+ S understands the procedure of throwing the cube and moving the engines forward and learns to do this without help. S knows whose turn comes next, who won, and observes the rules with regard to the obstructions.

2. *Drawing a border*

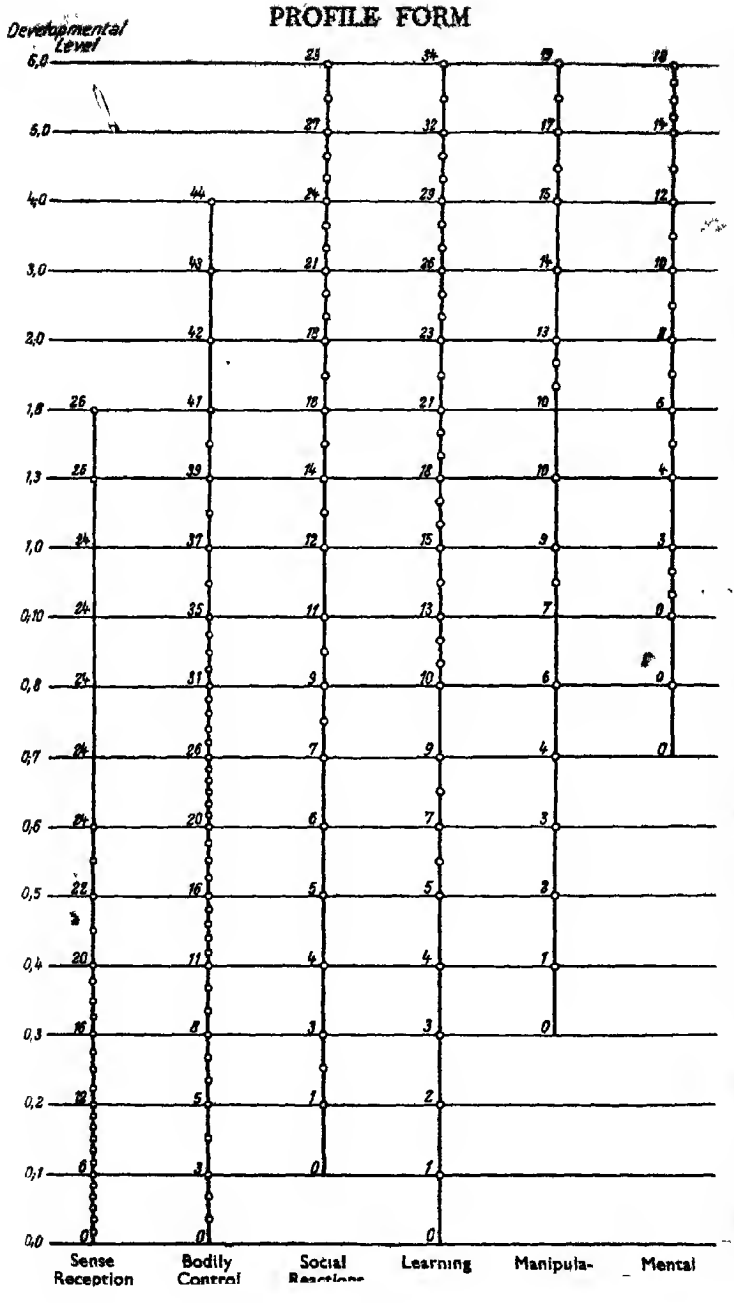
After the drawing (Test 5) is completed E says "Now we must make a pretty border around your drawing Look!" He draws, beginning in the left corner of the upper end, the border patterns twice, saying as he draws· "ring, triangle, cross; ring, triangle, cross" Then "now you finish this border" S is asked to repeat "ring, triangle, cross" as he draws these figures If the triangle is a failure, due to poor co-ordination, it has to be practised before the border can be drawn.

+ S understands what is required and completes the border with less than six errors In counting errors the three figures are counted as one unit which is either correct or wrong. Interchanging of figures within a group does not count as an error.

3. *Repeating a verse of sixteen syllables*

E sits down with the child and gives the following instructions: "Now I am going to say a little verse that I want you to repeat

PROFILE FORM



after me. But listen to me first." When the child seems to be attentive, E says slowly:

These apples look so good to me,
I wish I could have two or three

+ The child repeats without errors.

4 *Building a complicated structure in imitation*

S is encouraged to build with the blocks (3) whatever he wants. When this has been done (it usually takes 4 or 5 minutes) E says: "Now I'll show you something and I want you to look closely so that you can make one like it." He builds a structure (Fig 45) with the second set and asks the child to let it stand and make one like it with his own blocks

+ S imitates it without errors Interchanging blocks of different colours does not count as an error.

5. *Meaningful drawing*

S is asked to draw something on the paper (2) but to leave the margin blank.

+ S draws something that may be recognized by some characteristic.

6. *The patience game (two mice)*

The patience game (4) is given the child, and if S does not seem to understand spontaneously, E explains that the mice are to be caught. The game is left with him until he voluntarily ceases to play with it.

+ S catches both mice and shows a desire to continue after the first successful solution.

7. *Taking off a hook to get an object*

The child is shown the block suspended as shown in Fig. 47, and is asked to get it without pulling the loose end of the string.

If he nevertheless tries this several times E may ask him to stand back and look at it before trying to get it.

+ S undoes the hook, pulls the block down by the loose end of the string, or lifts the hook so that the block comes down.

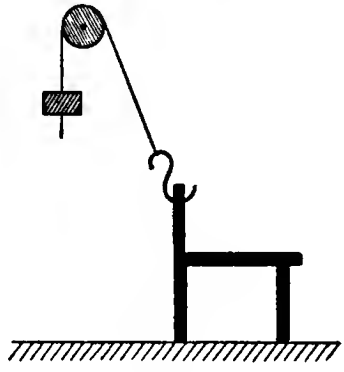


FIG 47

8. *Understanding the causal relationship of three pictures*

The three pictures (Fig 46) are shown the child, and he is asked to say what he sees in the first picture This is repeated for the second, and in case the child simply enumerates the objects in it, he is asked what the dog is doing Then he is to say what has happened in the third picture. If he does not seem to notice the relation between II and III spontaneously, E may ask. "Who did that?" (answer: "the dog"); "What did he do?" (answer: "he pulled down the cloth").

+ The relation between I, II, and III is understood and verbally expressed. The only permissible explanation is: "the dog has pulled down the table cloth," since no other explanation can show definitely that the sequence is understood.

9. *Noticing mistakes in a picture*

The picture (Fig 48) is shown and the child is asked to say what there is in it. If he does not remark spontaneously about

the mistakes he should be asked if there isn't something wrong or funny about the picture.

+ S discovers at least one mistake.

10. *Connecting merchandise and shops*

The different pictures of shops (8) are shown one by one and the child asked to name them. If the name does not occur to the child, E may enumerate some of the things one can buy there If after that the name is not given or is too specialized (doll shop, racket shop), the right name may be given by E and the child asked to repeat it All these pictures are arranged before S and E selects the 5 hardest merchandise

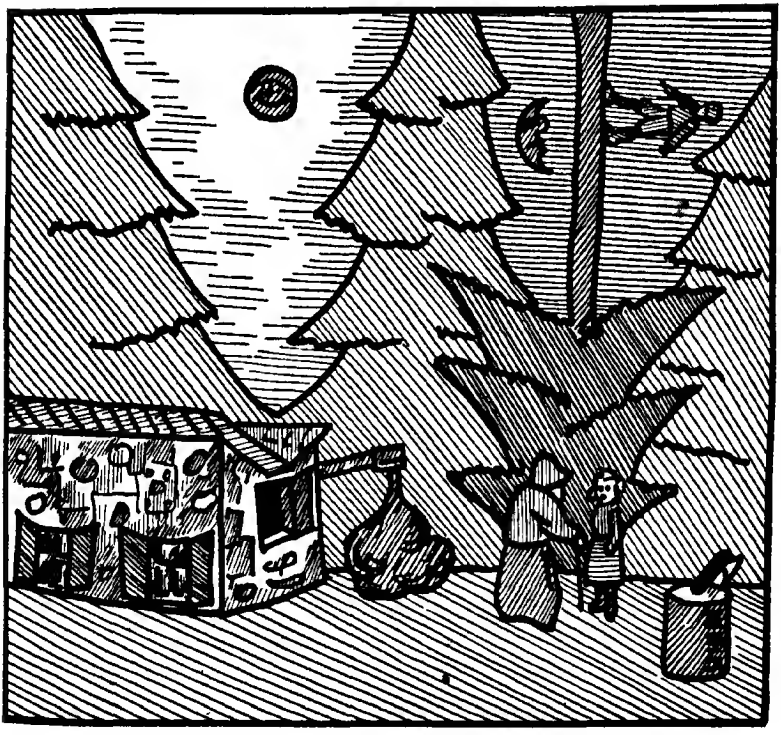


FIG 48

pictures (bread, cubes, clubs, handle, necktie), saying: "This is bread, where can you get that?" "Show me the shop." E puts the picture in one of the vacant rectangles on the picture indicated The four others are treated in the same way, except that the child is to put them where they belong. Now the remaining pictures are handed to him with the instruction to put each picture in the proper shop. No further help should be given in finding the right place for each picture, but questions regarding the nature of the merchandise may be answered. The time from the moment the child begins to arrange the pictures until he finishes is noted. If possible E should not remain close to the child.

+ The solution is reached independently and does not take more than 7 minutes nor show more than four mistakes.

MATERIALS REQUIRED FOR THE SIXTH-YEAR TESTS
(Figures 44–49)

1. A race game with twenty fields in which the fields are distinguished by six different colours rather than by the usual numbers. The order of colours is black, white, blue, yellow, green, red A cube measuring 1 5 cm is used instead of dice. Its six sides are painted in the above six colours. Paper flags (2 by 1 5 cm) are used as obstructions and attached to long pins. They are provided with four signs: a triangle, a + sign, a cross, and a ladder Two different blocks or small tin locomotives may be used as trains (see Fig 44).

2 A piece of paper (20 by 17 cm) on which a 1 cm. wide margin has been drawn in pencil. A coloured pencil.

3 Two sets of blocks, each set containing

1 rectangular brown block, 2 by 2 by 6 cm.
2 rectangular brown blocks, 2 by 2 by 1 cm
2 rectangular brown blocks, 2 by 2 by 2 cm.
2 rectangular brown blocks, 1 by 2 by 4 cm
3 rectangular white blocks, 2 by 2 by 2 cm.
3 rectangular white blocks, 2 by 2 by 4 cm.
1 brown arch, 2 by 2 by 4 cm
4 white cylinders, diameter 2 cm , height 2 cm.
2 blue triangular pieces, base 2 by 2½ cm
(See Fig 45)

4. A glass-covered box, diameter 6 cm., in which are two stationary mouse-traps and two tin mice (Fig 46).

5 A string, 2 metres long. A block is fastened 20 cm from one end, to the other end a hook is fastened which should be heavier than the block. This string should be pulled through a ring attached to the ceiling or elsewhere in the room This ring should be too small to permit the block to pass through. The hook is attached to the back of a chair (Fig 47).

6. Picture-story as used by Schlotte[324] (Fig 46). The pictures are arranged together on a piece of cardboard.

7. A picture with mistakes (Fig 48)

8 Five pieces of cardboard (22 by 15 cm) on which the picture of a shop occupies the upper third The shops are a grocery shop, a shop for sports articles, a drug store, a clothing shop, a toy shop.* Under

* For English children the drug store should be substituted by a flower shop.

each shop-picture are six or four empty rectangles (4 by 7½ cm.). Thirty pieces of paper the size of these rectangles show various items of merchandise

a bag of golf clubs	a shaving brush
roller skates	a tooth brush
ice skates	a tube of shaving cream
a dumb-bell	a piece of soap
a doll	a bottle of tomato ketchup
toy animals	vegetables
a toy train	fruit
blocks	cheese
balls	bread
a top	eggs
a hat	roses
a necktie	carnations
ladies' dresses	tulips
lady's coat and costume	pansies
shoes	
coat and trousers	

9. A chair.
10. A stopwatch.

APPENDIX I

THE EVALUATION OF TEST RESULTS

1. Girl, CA 0 ; 4+22.

Series / Item	0 ; 2	0 , 3	0 ; 4	0 ; 5	0 , 6
1	−	+	+	+	
2	+	+	+	−	
3	+	−	+	−	Omitted:
4	+	−	+	−	only two
5	+	−	+	−	items of
6	+	+	−	−	previous
7	+	+	−	+	series
8	+	+	+	−	passed
9	+	+	+	−	
10	+	+	−	−	
Passed ..	9	7	7	2	0
Missed	1	3	3	8	10
Each item counts	3	3	3	3	3 day

The DA is determined by subtracting from the BA (0 , 4) the items missed in 0 , 2 and 0 , 3 and by adding to it the items passed in 0 , 4, 0 , 5, and 0 , 6 Hence, DA = 0 , 4−4×3 days+9×3 days = 0 , 4+15

2 Boy, CA 3 , 7

Series / Item	1 , 6	2 , 0	3 , 0	4 , 0	5 ; 0
1		+	−	−	
2		+	−	−	
3	Omitted	+	−	−	Omitted:
4	more than	+	+	−	only two
5	eight items	+	−	+	items of
6	of next	+	+	−	previous
7	series	+	+	−	series
8	passed	+	−	−	passed
9		+	+	+	
10		+	+	−	
Passed . ..	10	10	5	2	0
Missed . .	0	0	5	8	10
Each item counts	18	36	36	36	26 days

Hence, DA = 3 ; 0+7×36 days = 3 , 8+12.

3. Girl, CA 3 ; 5.

Series / Item	1 ; 0	1 ; 3	1 ; 6	2 ; 0	3 , 0	4 ; 0	5 ; 0
1	+	−	−	−	−		
2	+	−	−	−	−		
3	+	−	−	−	−	Omitted:	
4	+	+	−	−	−	none of the	
5	+	+	−	−	−	items of the	
6	+	+	−	−	−	previous	
7	+	−	−	−	−	(basic)	
8	−	+	−	−	−	series passed	
9	+	+	−	−	−		
10	+	+	−	−	−		
Passed	9	6	0	0	0		
Failed .	1	4	10	10	10		
Each item counts .	9	9	18	36	36 days		

DA = 3 , 0 − 10 × 18 − 10 × 36 − 5 × 9 days = 3 , 0 − 585 days = 1 , 4 + 15

APPENDIX II

ITEMS INCLUDED IN THE PRELIMINARY WORK BUT NOT INCORPORATED IN THE FINAL SERIES

First Year

1. Turning the head sideways while in prone position
2. Raising the head when in the bath.
3. Co-ordinated eye movements.
4 Inhibition of movement at a loud noise.
5 Noticing a light on the periphery of the field of vision.
6. Excitement at the ringing of a bell
7 Negative reaction to a black mask
8 Positive reaction to tactual impressions (hairbrush)
9 Negative reaction to the unknown.
10. Preferring adults to toys
11. Listening to music
12 Allowing the hand to be stroked with a brush.
13 Actively moving a rattle hanging on a string.
14 Being indifferent to, later reacting positively to, tactual stimulation.
15 Grasping with thumb and index finger
16 Interest in events
17. Positive reaction to light.
18. Disregarding obstacles to look at passing adults.
19. Looking out of the window
20. Bringing the bottle to the mouth
21 Memory test with the rattle.
22. Sitting on E's arm without support.
23. Sitting up in the bath.
24. Knocking cubes together.
25. Curiosity test with cloth over the bed railing

SECOND YEAR

1 Holding an object while standing with support.
2 Getting up to a standing position
3 Walking with support
4 Lifting an object while standing free.
5 Carrying an object while walking without support.
6 Climbing
7 Putting cubes into a box
8 Examining the mask
9 Arranging cubes in a row
10 Drumming with two sticks without being shown how.
11 Assisting in putting on and taking off a stocking
12 Finding an object under one of several identical boxes

THIRD–FIFTH YEARS

1 Walking on a straight line
2 Standing on one foot
3 Walking on the toes
4 Reaching for a rusk between two towers of cubes
5. Verbal formulation of perception of size.
6 Naming colours
7 Grouping colours
8 Perseverance in sorting.
9 Sorting according to kind
10 Repeating six syllables
11 Repeating ten syllables
12 Repeating fourteen and more syllables
13 Specific treatment of plasticine
14 Specific treatment of Matador.
15. Driving a nail
16. Putting together a picture that has been cut up in parallel horizontal strips
17 Putting together a picture that has been cut up in parallel diagonal strips
18 Arranging sticks according to sample
19. Folding a sheet of paper in half according to sample.
20 Folding a sheet of paper diagonally according to sample.

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Am. J Ps	American Journal of Psychology
Ar ges Ps	Archiv fuer die gesamte Psychologie
Ar Kr	Archiv fuer Kriminalanthropologie und Kriminalistik
Arch f. Paed	Archiv fuer Paedagogik
Ar Pt	Archiv fuer Psychiatrie
Ar. Ps	Archives de Psychologie
Australas J Ps and Phil	Australasian Journal of Psychology and Philosophy
Br J Ps	British Journal of Psychology
Bu. Soc Ant Bruxelles	Bulletin de la Société d'Anthropologie de Bruxelles
D Ps .	Deutsche Psychologie
Gen Psych Mon	Genetic Psychology Monographs
Jahrb f Kinderheilk	Jahrbuch fuer Kinderheilkunde
J Abn Ps	Journal of Abnormal Psychology
J Appl Ps .	Journal of Applied Psychology
J de Psych . .	Journal de Psychologie
J Ed. Ps	Journal of Educational Psychology
J Ed Res	Journal of Educational Research
J Exp Psych	Journal of Experimental Psychology
J Ps Asth	Journal of Psycho-Asthenics
Kl Ps	Klinik fuer psychische und nervoese Krankheiten
M Pt N .	Monatschrift fuer Psychiatrie und Neurologie
Pd Ma	Paedagogisches Magazin
Pd Mon	Paedagogische Monographien
Pd Ps Arb.	Paedagogisch-psychologische Arbeiten des Leipziger Lehrervereins
Pd Ps Fo	Paedagogisch-psychologische Forschungen
Pd Sem	Pedagogical Seminary
Psych Bull . ..	Psychological Bulletin
Psych Mon	Psychological Monographs
Qu u St z Jugendk	Quellen und Studien zur Jugendkunde
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